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K4E21-170161/A
Birchbank, B.C.

Cableway Deconstruction

Project Specifications and Drawings

Project No.: R.082003.001

Date: June 2017

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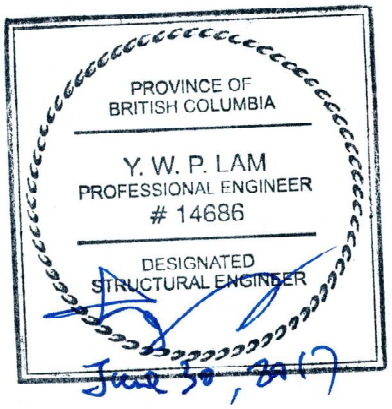
June 2017



1.0 GENERAL

1.1 CODES

.1 Perform work in accordance with National Building Code for Canada 2015, WORKSAFE BC, and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Meet or exceed requirements of specified standards, codes and referenced documents.

1.2 DESCRIPTION OF WORK

.1 Work under this Contract is to take place at Birchbank site, which is located about 7km north of Trail, B.C. as shown on site plan on drawing S1. The right bank can be accessible from the access road adjacent to the CP Rail and the left bank can only be accessed via helicopter or boat crossing.

.2 Work to be performed includes, but is not limited to, the provision of all labour, materials, services and equipment necessary for the deconstruction of cableway components including all cables, moving cart, steel framed towers including their connections and the concrete footings as fully described in the Tender Documents and cart away the components off the site.

.3 "Green" requirements:

.1 Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.

.2 Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting material from landfill.

1.3 CONTRACT DOCUMENTS

.1 The Contract documents, drawings and specifications are intended to complement each other.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general methodology of the deconstruction work.

1.4 TIME OF COMPLETION

.1 Commence work immediately upon official notification of acceptance of offer and complete the project within twelve (12) weeks after contract award.

1.5 HOURS OF WORK

.1 Hours of work:

.1 No restriction on hours of work by the Contractor but subject to provincial and/or municipal bylaw for noise control.

1.6 WORK SCHEDULE

.1 Carry out work as follows:

.1 Within 10 working days after Contract award, submit Deconstruction Progress Schedule

Bar (GANTT) chart indicating the following:

.1 Submission of shop drawings including detailed methodology of the deconstruction, demolition & environmental protection plan, and archaeology monitoring plan, product data, MSDS sheets and samples.

.2 Commencement and completion of work of each section of the specifications or trades for each phase as outlined.

.3 Final completion date within the time period required by the Contract documents.

.2 Do not change approved Schedule without notifying Departmental Representative.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

1.7 DIVISION OF SPECIFICATIONS

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

1.8 COST BREAKDOWN

.1 Before submitting the first progress claim, submit a breakdown of the Contract lump sum prices in detail as directed by the Departmental Representative and aggregating Contract price. After approval by Departmental Representative, cost breakdown will be used as basis for progress payments.

1.9 CODE, BYLAWS, STANDARDS

.1 Perform work in accordance with the National Building Code of Canada (NBC) 2015, and other indicated Codes, Construction Standards and/or any other Code or Bylaw of local application.

.2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.

.3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.

.4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

1.10 DOCUMENTS REQUIRED

.1 Maintain one copy each of the following at the job site:
- .1 Contract drawings.
- .2 Contract specifications.
- .3 Addenda to Contract documents.
- .4 Copy of work schedule.
- .5 Reviewed shop drawings.
- .6 Change orders.
- .7 Other modifications to Contract.
- .8 Field test reports.
- .9 Reviewed samples.
- .10 Manufacturer's installation and application instructions.
- .11 One set of record drawings and specifications for "as-built" purposes.
- .12 National Building Code of Canada 2015.
- .13 Current construction standards of workmanship listed in technical Sections.
- .14 Building Safety Plan.
- .15 Building Permit.
- .16 Request for Information (RFI).
- .17 Contemplated Change Notices.
- .18 WHMIS Documents.
- .19 Site Instructions.
- .20 Contractor's Health and Safety Plan, including map to nearest hospital.

1.11 REGULATORY REQUIREMENTS

.1 Permit

.1 Obtain and pay for Demolition Permit, Certificates, Licenses and other permits required by regulatory municipal and provincial authorities to complete the work including but not limited to the permits as follows:

- HCA (Heritage Conservation Act) permit for work on both left and right banks.

.2 Provide inspection authorities with plans and information required for issue of acceptance certificates.

.3 Furnish inspection certificates in evidence that the work installed conforms with the requirements of the authority having jurisdiction.

1.12 ENVIRONMENTAL REQUIREMENTS

.1 Hazardous Materials: product, substance, or organism that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.2 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS).

.3 An environmental assessment report is attached in Appendix A to this specification. Perform work with protective equipment and procedures applicable for the hazardous materials indicated and Comply with Canada Labour Code, Part II requirements and BC Occupational Health and Safety Regulation (OHSR) and Worksafe BC, whichever are more stringent.

1.13 CONTRACTOR'S USE OF SITE

.1 Use of site:

.1 Exclusive and complete for execution of work.

.2 Assume responsibility for assigned premises for performance of this work.

.3 Be responsible for coordination of all work activities on site, including the work of other contractors engaged by the Departmental Representative where applicable.

.4 Provide security of Contractor's work site and all Contractors and Subcontractor's equipment and material. Secure Contractor's work site at the end of each work day.

.5 Perform work in accordance with the Contract documents. Ensure work is carried out in accordance with indicated phasing.

.6 Do not unreasonably encumber site with material or equipment

.7 Do not obstruct access to the property outside of the Contractor's work site. Maintain overhead clearances, keep roadways and walkways clear, and maintain routes for emergency response vehicles.

.8 The work on the both left and right banks will require a HCA (Heritage Conservation Act) permit.

.9 Deconstruction work activities may encroach on CP Rail Right-of-Way given that the right bank tower footing for the backstay and aircraft cable is very close to the rail line. The contractor has to notify CP Rail and they may request that the entire footing be left in place.

.10 It is the contractor's responsibility to obtain access/authorization as needed to access the site and work at the site, including the staging areas.

.11 Coordinate and obtain approval from the CP Rail as required on the permission and time slots for vehicle access crossing the railway. If approved by the CP Rail for vehicle crossing the railway, provide proper protection to the railway not to cause damage to the railway due to vehicle access. Perform work in strictly conformance with the CP Rail's requirements for use of the railway. Seek CP Rail's consent and permit for any deconstruction activities and/or staging area within the CP Rail Right-of-Way.

.12 Provide his own water and sanitary services on site during the construction period.

.2 Perform work in accordance with Contract documents. Ensure work is carried out in accordance with approved schedules.

.3 Do not unreasonably encumber site with material or equipment.

1.14 EXAMINATION

.1 Examine site and be familiar and conversant with existing conditions likely to affect work.

.2 Provide photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.

1.15 EXISTING SERVICES

.1 Where Work involves breaking into or connecting to existing services, carry out work as directed by the authority having jurisdiction.

.2 Record locations of maintained, re-routed and abandoned service lines.

.3 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.16 SETTING OUT OF WORK

1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Provide devices needed to lay out and construct work.

.3 Supply such devices as templates required to facilitate Departmental Representative's inspection of work.

1.17 ACCEPTANCE OF SUBTRADES

1 Each trade shall examine surfaces prepared by others and job conditions which may affect his work, and shall report defects to the General Contractor. Commencement of work shall imply acceptance of prepared work or substrate surfaces.

1.18 QUALITY OF WORK

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 The workmanship, erection methods and procedures to meet minimum standards set out in the City of National Building Code of Canada 2015 and Construction Standards as specified herein.

.3 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

1.19 WORKS COORDINATION

.1 Coordinate work of sub-trades:

.1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.

.2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.

.1 Provide each subcontractor with complete plans and specifications for Contract, to assist them in planning and carrying out their respective work.

.2 Develop coordination drawings when required, illustrating potential interference between work of various trades and distribute to affected parties.

.1 Pay particularly close attention to overhead work above deconstruction elements.

.2 Identify on coordination drawings, deconstruction elements, services lines, rough-

in points and indicate location services entrance to site.

.3 Facilitate meeting and review coordination drawings. Ensure subcontractors agree and sign off on drawings.

.4 Publish minutes of each meeting.

.5 Plan and coordinate work in such a way to minimize quantity of service line offsets.

.6 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.

.3 Submit shop drawings and order of deconstruction or rebuilt components only after coordination meeting for such items has taken place.

.4 Work cooperation:

.1 Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.

.2 Ensure that each trade provides all other trades reasonable opportunity for completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed work.

.3 Ensure disputes between subcontractors are resolved.

.4 Departmental Representative is not responsible for, or accountable for extra costs incurred as a result of Contractor's failure to coordinate Work.

.5 Maintain efficient and continuous supervision.

1.20 APPROVAL OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

.1 In accordance with Section 01 33 00, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.

.2 Allow sufficient time for the following:

.1 Review of product data.

.2 Approval of shop drawings.

.3 Review of re-submission.

.4 Ordering of approved material and/or products. Refer to individual technical sections of specifications.

1.21 PROJECT MEETINGS

.1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

.2 Departmental Representative will arrange pre-deconstruction meeting. Contractor is responsible to record and issue meeting minutes two (2) days after the meeting.

1.22 TESTING AND INSPECTION

.1 Particular requirements for inspection and testing to be carried out by testing service or laboratory approved by the Departmental Representative.

.2 The Contractor will appoint and pay for the services of testing agency or testing laboratory as

specified, and where required for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Within 15 working days after Contract award provide a list of proposed testing services or testing laboratories for Departmental Representative's approval.

.4 The Departmental Representative may require, and pay for, additional inspection and testing services not included in paragraph 1.21.2.

.5 Where tests or inspections by designated testing laboratory reveal work is not in accordance with the Contract requirements, Contractor shall pay costs for additional tests or inspections as the Departmental Representative may require to verify acceptability of corrected work.

.6 Contractor shall furnish labour and facilities to carry out specified testing and notify Departmental Representative in advance of planned testing.

.7 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.8 Provide Departmental Representative with 2 copies of testing laboratory reports as soon as they are available.

1.23 RELICS AND ANTIQUITIES

.1 Relics and antiquities and items of historical or scientific interest shall remain property of Departmental Representative. Protect such articles and request directives from Departmental Representative.

.2 Provide archaeological monitoring by qualified personnel during the excavation. Contract should as his own cost hire local FN cultural observers or an archaeological firm to be present during any excavation.

. 3 Give immediate notice to Departmental Representative if evidence of archeological finds are encountered during excavation/deconstruction, and await Departmental Representative's written instructions before proceeding with work in this area. Provide documentation to include photographs of what was seen, the location of where the material was encountered, what the surrounding soil looked like, how deep it was from the ground surface, or if it was at ground surface.

.4 Refer to Appendix B on Archeological Overview Assessment for requirements and measures to mitigate possible impacts to archaeological resources.

1.24 AS-BUILT DOCUMENTS

.1 The Departmental Representative will provide 2 sets of drawings and specifications and PDF files

for "as-built" purposes.

.2 Keep one set of current white prints of all contract drawings and all addenda, revisions, clarifications, change orders, and reviewed shop drawings in the site office; and have them available at all times for inspection by the Consultant.

.3 As the work progresses, maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings and shop drawings as changes occur.

.4 Provide accurate as-built drawings by a qualified professional surveyor identifying the various elements shown on the drawings in the requested format.

.5 At completion of the Work, transfer all deviations, including those called up by addenda, revisions, clarifications, shop drawings and change order, to a set of Issued for Construction drawings. Submit the 'red-marked' as-built set to the Departmental Representative in hard copy with contractor's review stamp and date confirming that the set submitted are a true record of "as-built" information.

1.25 DUST CONTROL

.1 Provide temporary dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.

.2 Maintain and relocate protection until such work is complete.

1.26 ENVIRONMENTAL PROTECTION

.1 Prevent extraneous materials from contaminating air beyond construction area, by providing temporary enclosures during work.

.2 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.

.3 Ensure proper disposal procedures in accordance with the Departmental Representative requirements and all applicable territorial regulations.

1.27 ADDITIONAL DRAWINGS

.1 The Departmental Representative may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with drawings referred to in the Contract Documents.

.2 Departmental Representative will furnish up to a maximum of four (4) sets of Contract drawings and four (4) sets of specification for use by the Contractor at no additional cost. PDF files of all documents will be provided. Should more documents be required, the Departmental Representative will provide them at additional cost.

1.28 MATERIAL DISPOSAL

.1 all material designated to be removed will become the property of the Contractor and will be

disposed of in an environmentally acceptable manner so that they neither become a menace to marine navigation nor a nuisance to the public on adjacent or any other property.

.2 Unless otherwise specified, all existing material to be replaced or renewed will be disposed of in accordance with .1 above.

1.29 SYSTEM OF MEASUREMENT

.1 The imperial system of measurement (US) will be employed on this Contract.

1.30 FAMILIARIZATION WITH SITE

.1 Before submitting tender, visit site as indicated in tender documents and become familiar with all conditions likely to affect the cost of the work.

1.31 SUBMISSION OF TENDER

.1 Submission of a tender is deemed to be confirmation of the fact that the Tenderer has analyzed the Contract documents and inspected the site, and is fully conversant with all conditions.

END OF SECTION 01 11 55

1.0 GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.4 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.5 Verify field measurements and affected adjacent Work are co-ordinated.

.6 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.8 Keep one reviewed copy of each submission on site.

.9 Do not proceed with work until relevant submissions are reviewed by Departmental Representative.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 When specified in the Contract document, submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia of Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 days for Departmental Representative's review of each submission, unless noted otherwise.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
  - .11 Detailed deconstruction methodology, demolition plan, associated environmental protection plan and archaeology monitoring plan.

.9 After Departmental Representative's review, distribute copies.

.10 Submit electronic copy of shop drawings for each requirement requested in specification sections and as Departmental Representative may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in

specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Delete information not applicable to project.

.15 Supplement standard information to provide details applicable to project.

.16 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.17 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of Construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

.18 Electronic submissions will only be reviewed and returned electronically. No hardcopies will be returned to contractor.

1.3 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement and as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Viewpoints and their locations as reasonably determined by Departmental Representative.

.4 Provide photographic documentation of adjacent existing conditions prior to commencement of construction for determining and accidental damage as a result of contractor's work.

.5 Frequency of photographic documentation: monthly as directed by Departmental Representative.

.1 Upon completion of: demolition, framing and services before concealment of Work, and as directed by Departmental Representative.

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Submit electronic copies of test results and inspection reports required as noted in each section of specifications.

END OF SECTION 01 33 00

Part 1 General

1.1 REFERENCES

.1 Government of Canada

.1 Canada Labour Code, Part 2 Canada Occupational Safety and Health Regulations.

.2 Canada Occupational Health and safety Regulations.

.2 National; Building Code of Canada (NBC) 2015

.1 Part 8 – Safety Measures at Construction and Demolition Sites

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.4 Province of British Columbia.

.1 Workers Compensation Act Part 3 - Occupational Health and Safety, RSBC 1996 – Current Edition.

.5 Canadian Standards Association (CSA) as amended:

.1 CSA Z797-2009 Code of Practice for Access Scaffold.

.2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes.

.3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.

.6 American National Standards Institute (ANSI):

.1 ANSI A10.3 Operations – Safety Requirements for Powder-Actuated Fastening Systems.

1.2 RELATED SECTIONS

.1 All specification sections.

1.3 WORKER'S COMPENSATION BOARD COVERAGE

.1 Comply fully with the Worker's Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.4 COMPLIANCE WITH REGULATIONS

.1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation act or the Occupational Health and Safety Regulations.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit to Departmental Representative, submittals in accordance with Section 01 11 55 - General Instructions.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Submit the following:

- .1 Health and Safety Plan.
- .2 Copies of Reports or Directions issued by Federal and Provincial health and safety inspectors.
- .3 Copies of incident and accident reports.
- .4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.4 The Departmental Representative will review the Contractor's site-specific Health and Safety Plan and emergency procedures and provide comments to the Contractor within seven (7) business days after receipt of plan. Revise plan as appropriate and resubmit to Departmental Representative.

.5 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

.6 Submission and resubmission of the Health and Safety Plan to the Departmental Representative is for information and reference purposes only. It shall not:

- .1 Be continued to imply approval by the Departmental Representative.
- .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
- .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.6 RESPONSIBILITY

.1 Assume responsibility as the Prime Contractor for work under this Contract.

.2 Be Responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to the extent that they may be affected by conducted work.

.3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local status, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.7 HEALTH AND SAFETY CO-ORDINATOR

.1 The Health and safety Coordinator/Registered Occupational Hygienist/Certified Industrial Specified Hygienist must:

.1 Be responsible for completing all health and safety training sessions and ensuring that personnel not successfully completing training are not permitted to enter site to perform work.

.2 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.3 Be on site during execution of work.

1.8 GENERAL CONDITIONS

.1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

.2 Secure site at night time as deemed necessary by Departmental Representative to protect site against entry.

1.9 PROJECT/SITE CONDITIONS

.1 Work at site will involve:

.1 Environment and Climate Change Canada (ECCC) and site representatives.

.2 Departmental Representative – Public Works and Government Services (PWGSC).

1.10 REGULATORY REQUIREMENTS

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

.2 In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental representative will advise on the course of action to be followed.

1.11 WORK PERMITS

.1 Obtain and pay for speciality permits related to a project before start of work.

1.12 FILING OF NOTICE

.1 The Contractor is to complete and submit a Notice of Project as required by provincial authorities.

.2 Provide copies of all notices to the Departmental representative.

1.13 HEALTH AND SAFETY PLAN

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risk and safety hazards.

.2 Prepare and comply with a site-specific project health and Safety Plan based on hazard assessment, including but not limited to, the following:

.1 Primary requirements:

1. Contractor's safety policy.
2. Identification of applicable compliance obligations.
3. Definition of responsibilities for project safety/organization chart for project.
4. General safety rules for projects.
5. Job-specific safe work, procedures.
6. Inspection policy and procedures.
7. Incident reporting and investigation policy and procedures.
8. Occupational Health and Safety Committee/Representative procedures.
9. Occupational Health and Safety meetings.
10. Occupational Health and Safety communications and record keeping procedures.
11. Additional Requirements: Collaborate with Parks staff on site to be aware of Species at Risk that may be encountered on site during the work, for example nests. Co-operate with Parks staff on site in mitigation measures to protect Species at Risk.

.2 Include summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.

.3 List hazardous materials to be brought on site as required by work.

.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

.5 Identify personal protective equipment (PPE) to be used by workers.

.6 Identify personnel and alternates responsible for site safety and health.

.7 Identify personnel training requirements and training plan, including site orientation for new works.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to Departmental Representative.

.5 Departmental Representative's review: the review of the Health and Safety Plan by Public Works Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.14 EMERGENCY PROCEDURES

.1 List standard operating procedures and measures to be taken in emergency situations, include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

- .1 Designated personnel from own company.
- .2 Regulatory agencies applicable to work and as per legislated regulations.
- .3 Local emergency resources.
- .4 Departmental representative site staff.

.2 Include the following provisions in the emergency procedures:

- .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
- .2 Evacuate all workers safely.
- .3 Check and confirm the safe evacuation of all workers.
- .4 Notify the fire department or other emergency responders.
- .5 Notify adjacent workplaces which may be affected if the risk extends beyond the workplace.
- .6 Notify Departmental representative site staff.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:

- .1 Work at high angles.
- .2 Work with hazardous substances.

.4 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.15 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous regarding labelling and provision of Material Safety data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:

.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 11 55 – General Instructions.

.2 In conjunction with Departmental Representative, schedule to carry out work during "off hours".

1.16 ELECTRICAL SAFETY REQUIREMENTS

.1 Comply with authorities.

.1 Maintain electrical safety procedures and take necessary precautions to ensure safety for all personnel working under this Contract, as well as safety of other personnel on site.

1.17 OVERLOADING

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation or damage to existing structure and finishes.

1.18 FALSEWORK

.1 Design and construct falsework in accordance with CSA S269.1.

1.19 SCAFFOLDING

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797 and B.C. Occupation Health and Safety Regulations.

1.20 FIRE SAFETY REQUIREMENTS

.1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code.

1.21 FIRE PROTECTION AND ALARM SYSTEM

.1 Fire protection and alarm system shall not be:

.1 Obstructed.

.2 Shut off.

.3 Left inactive at the end of a working day or shift.

.2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.

.3 Be responsible/liable from costs incurred from the fire department, Departmental Representative resulting from false alarms.

1.22 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing. Refer to Specification Section 01 11 55 - General Instruction for information on existing hazardous materials.

1.23 POSTED DOCUMENTS

.1 Post legible versions of the following documents on site:

.1 Health and Safety Plan.

.2 Sequence of Work.

.3 Emergency procedures.

.4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

.5 Notice of Project.

.6 Site plans.

.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.

.8 Workplace Hazardous Materials Information System (WHMIS) documents.

.9 Material Safety Data Sheets (MSDS).

.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all works and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.24 MEETINGS

.1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

1.25 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

.3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The

General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

1.0 GENERAL

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction and is to include pre-work surveys and monitoring as per the Environmental Assessment Report in the Appendix A.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan to include:

- .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
- .2 Names and qualifications of persons responsible for manifesting contaminated soils and hazardous waste to be removed from site.
- .3 Names and qualifications of persons responsible for training site personnel.
- .4 Descriptions of environmental protection personnel training program.
- .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods of control runoff and to contain materials on site.
- .7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Historical, archaeological, culture resources biological resources and wetlands plan that defines procedures for identifying and protecting historical archeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan to be included and updated, as required.

.16 Pre-work surveys and monitoring as per the Environmental Assessment Report in the Appendix A.

1.3 FIRES

.1 Fires and burning of rubbish on site is not permitted.

1.4 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways.

1.5 DRAINAGE

.1 Provide Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls provided. Ensure plan includes monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3 requirements.

.2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.

.3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 WORK ADJACENT TO WATERWAYS

.1 Construction equipment to be operated on land only.

.2 Do not use waterway beds for borrow material without Departmental Representative's approval.

.3 Waterways to be free of excavated fill, waste material and debris.

.4 Design and construct temporary crossings to minimize erosion to waterways.

.5 Do not skid logs or construction materials across waterways.

1.7 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.1 Provide temporary enclosures where directed by Departmental Representative.

1.8 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties as indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zone.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.9 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Do not take action until after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

END OF SECTION 01 35 43

1.0 GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel “T” bar fence posts spaces at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

.2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and constriction procedures.

1.4 GUARD RAILS AND BARRICADES

.1 Provide as required by governing authorities.

1.5 DUST TIGHT SCREENS

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.8 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

.2 Maintain clearance for all egress routes.

1.9 PROTECTION OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management And Disposal.

END OF SECTION 01 56 00

1.0 GENERAL

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's Waste Management Plan and Goals.

.2 Accomplish maximum control of solid construction waste.

.3 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.

.3 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.4 Inert Fill: inert waste - exclusively asphalt and concrete.

.5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
- .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
- .2 Returning reusable items including pallets or unused products to vendors.

.10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.11 Separate Condition: refers to waste sorted into individual types.

.12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

.14 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.3 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
- .1 Waste Audit.
- .2 Waste Reduction Workplan.
- .3 Material Source Separation Plan.
- .4 Schedules A, B, C, D, E completed for project.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prepare and submit following prior to project start-up:
- .1 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
- .2 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.
- .3 Submit 2 copies of Materials Source Separation Program (MSSP) description.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
- .1 Failure to submit could result in hold back of final payment.
- .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
- .3 For each material reused, sold or recycled from project, include amount quantities by number, type and size of items and the destination.
- .4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 WASTE AUDIT (WA)

.1 Conduct WA prior to project start-up.

.2 Prepare WA: Schedule A.

.3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.6 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:
- .1 Destination of materials listed.
- .2 Deconstruction/disassembly techniques and sequencing.
- .3 Schedule for deconstruction/disassembly.
- .4 Location.
- .5 Security.
- .6 Protection.
- .7 Clear labelling of storage areas.
- .8 Details on materials handling and removal procedures.
- .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.7 DEMOLITION WASTE AUDIT (DWA)

.1 Prepare DWA prior to project start-up.

.2 Complete DWA: Schedule C.

.3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.8 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
- .1 Transport to approved and authorized recycling facility.

1.9 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect surface drainage, mechanical and electrical from damage and blockage.

.4 Separate and store materials produced during dismantling of structures in designated areas.

.5 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
- .1 On-site source separation is recommended.
- .2 Remove co-mingled materials to off-site processing facility for separation.
- .3 Provide waybills for separated materials.

1.10 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner, into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:
- .1 Number and size of bins.
- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.11 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Provide temporary security measures approved by Departmental Representative.

1.12 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

2.0 PRODUCTS

2.1 NOT USED

.1 Not Used.

3.0 EXECUTION

3.1 APPLICATION

.1 Do Work in compliance with WRW.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instruction on disposal practices.

.2 On-site sale of salvaged recovered reusable and/or recyclable materials is not permitted.

.3 Demolition Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Acoustical Insulation	100	
Doors and Frames	100	
Electrical Equipment	80	
Mechanical Equipment	100	
Metals	100	
Rubble	100	
Wood (uncontaminated)	100	
Other		

.4 Construction Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	
Plastic Packaging	100	
Rubble	100	
Steel	100	
Wood (uncontaminated)	100	
Other		

3.4 WASTE AUDIT (WA)

The following pertains to Schedule A - Waste Audit (WA). Column-1 refers to the category of waste, and a physical description of the material (e.g. off-cuts, clean drywall, etc.). Column-2 refers to the total quantity of materials received by the Contractor. Measurement units must be specified. Column-3 refers to the estimated percentage of material that is waste. Column-4 refers to the total quantity of waste (column-2 x column-3). Column-5 refers to the areas(s) in which the waste was generated. Column-6 refers to the total percentage of recycled material from the specified total quantity of waste (column-4). Column-7 refers to the total percentage of reused material from the specified total quantity of waste (column-4).

.1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity Unit %	(3) Estimated Waste	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood & Plastics						
Material Description						
Off-Cuts						
Warped						
Plastic						
Cardboard						
Other						
Doors & Windows						
Material Description						
Frames						
Glass						
Wood						

Metal						
Other						

3.6 WASTE REDUCTION WORKPLAN (WRW)

The following pertains to Schedule B - Waste Reduction Workplan (WRW). Column-1 refers to the category and type of waste materials. Column-2 refers to the persons responsible for completing the WRW. Column-3 refers to Column-4 of Schedule A. Column-4 refers to the amount of reused waste predicted and realized. Column-5 refers to the amount of recycled waste predicted and realized. Column-6 refers to the approved recycling facility.

.1 Schedule B:

(1) Material Quantity Category	(2) Person Amount Responsible Waste	(3) Total of Project (unit)	(4) Reused Actual (units)	(5) Recycle Actual (s) Amount	(6) Material Destination (s)
Wood & Plastics					
Material Description					
Chutes					
Warped					
Plastic					
Cardboard Packaging					
Other					
Doors & Windows					
Material Description					
Painted					
Frames					
Glass					
Wood					
Metal					
Other					

3.7 DEMOLITION WASTE AUDIT (DWA)

The following pertains to Schedule C - Demolition Waste Audit (DWA). Column-1 refers to the type of material salvaged. Column-2 refers to the material quantity shown in column-1. Several columns may be required to identify specific demolition areas. Column-3 refers to the unit of measurement used to describe Column-2. Column-4 refers to the total quantity of salvaged material. Column-5 refers to the cumulative volume of salvaged material. Column-6 refers to the total weight in kilograms. Column-7 refers to remarks and assumptions made about the specified material.

.1 Schedule C - Demolition Waste Audit (DWA):

(1) Material Description Assumptions	(2) Quantity	(3) Unity	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks & Assumptions
Wood						
Wood						
Stud						
Plywood						
Baseboard -wood						
Door						
Trim-Wood						
Cabinet						
Doors & Windows						
Panel						
Regular						
Slab Regular						
Wood						
Laminate						
Byfold-Closet						
Glazing						

3.8 CANADIAN GOVERMENTAL DEPARTMENTS CHIEF REPSONSIBLITY FOR THE ENVIROMENT

.1 Schedule E - Government Chief Responsibility for the Environment:

.1 Ministry of Environment Lands and Parks
810 Blanshard Street, 4th Floor
Victoria, BC V8V 1X4
604-387-1161 / 604-356-6464

.2 Waste Reduction Commission Soils and Hazardous Waste
770 South Pacific Blvd, Suite 303
Vancouver BC, V6B 5E7
604-660-9550 / 604-660-9596

END OF SECTION 01 74 19

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 55 – General Instructions.

.2 Section 01 74 19 - Waste Management and Disposal.

1.2 INSPECTION AND DECLARATION

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Departmental Representative Inspection.

.3 Departmental Representative Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.4 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Work is complete and ready for final inspection.

.5 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

.6 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

.7 Commencement of Lien and Warranty Periods: date of Departmental Representative's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.8 Final Payment: when Departmental Representative considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

.9 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount.

1.3 CLEANING

.1 Clean site in accordance with Section 01 11 55 – General Instructions.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 19 - Waste Management and Disposal.

1.4 DOCUMENTS

.1 Collect reviewed submittals and assemble documents fully executed by subcontractors, suppliers, and manufacturers. Submit material prior to final Application for Payment.

.2 Submit as-built drawings in accordance with Section 01 11 55 – General Instructions.

.3 Provide warranties and bonds fully executed and notarized.

.4 Execute transition of Performance and Labour and Materials Payment Bond to warranty period requirements.

.5 Submit a final statement of accounting giving total adjusted Contract Price, previous payments, and monies remaining due.

.6 Departmental Representative will issue a final change order reflecting approved adjustments to Contract Price not previously made.

.7 Prior to applying for a certificate of Substantial Performance, provide the following:

.1 Reconciliation of all Change Orders.

.2 Workers' Compensation Board letter as evidence that the Contractor and all Subcontractors are in good standing.

.3 Letters of Assurance where required as a condition of the work.

.4 Occupancy Permit from local authority.

.5 Certification by all testing, cleaning or inspection authorities or associations.

.6 List of items to be completed or corrected, including the time required to perform the Work as well as the proposed completion date

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION 01 77 00

GENERAL

1.1 Related Sections:

.1 Section 01 11 55 – General Instructions
.2 Section 01 74 19 – Waste Management and Disposal

1.2 Documents:

.1 This section forms part of the contract documents and is to be read and interpreted with all other contract documents.

.2 The Contractor is to furnish all management, supervision, labour, materials, tools, consumables, supplies, equipment, temporary works, barriers, services, sundries, engineering, testing, safety and security required to diligently and fully complete the referenced and described work for deconstruction of the existing cableway structure and its removal from the site.

.3 The General Contractor is the "prime contractor" for the purpose of the WorkSafeBC rules and will have sole responsibility for the site, including security, safety, compliance with all WorkSafe BC regulations and to the requirements of all authorizes having jurisdiction during the scope of work on site.

.4 A site-specific hazardous materials abatement Scope of Work and Safe Work Procedures are required in accordance with WorkSafe BC Occupational Health and Safety Regulations. Workers performing any disturbance or removal of hazardous building materials must be adequately trained and qualified to do so or supervised by a qualified experienced hazardous materials contractor.

.4 The Contractor is to remove all utility systems, if any, within the work area in accordance with the requirements of authorities having jurisdiction. All underground utility work is to be completed as per WorkSafeBC rules and regulations.

1.3 Qualifications:

.1 Demolition Firm: Company(ies) experienced and specializing in performing the Work of this Section with documented experience in similar types of deconstruction work.

.2 Qualifications of Workers: Provide a Supervisor who shall be present at all times during the deconstruction work and who shall be thoroughly familiar with the work required and who shall direct all work. Provide one (1) person on site who is responsible for maintaining the safety barriers and protection of the workers and the public.

2.0 REGULATORY

2.1 The contractor must comply with WorkSafeBC Occupational Health and Safety Regulations and other applicable codes and regulations for deconstruction of buildings, safety of adjacent structures, dust control, and disposal and removal of common and hazardous waste/material. Refer also to Article 7 of this section.

2.2 Complete all deconstruction work according to the requirements of the Provincial Workers' Compensation Board Regulations (WorkSafe BC), BC Waste Management Act and Special Waste Regulation, and the Canadian Construction Safety Code. The most restrictive standard shall apply in instances where standards vary from one authority to the other.

2.3 The Contractor shall obtain all necessary permits, including but not limited to labelling, documentation, licensed transport from site, and disposal of all materials in legal manner to appropriate and registered sites and provide submittals to satisfy all regulatory requirements related to this work.

2.4 The contractor shall obtain all permits required for road closures, provide all flagging necessary for staff and public safety, / and submit notices of work to all authorities having jurisdiction in accordance with WorkSafeBC requirements. Do not close or obstruct safety exits, adjacent sidewalks, hydrants, parking or storage areas without prior approval of Owner.

2.5 Notify Departmental Representative and affected utility companies before starting Work, and comply with their requirements.

2.6 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials not documented prior to this Contract.

3.0 REQUIREMENTS

3.1 Provide all labour, materials, equipment and services required to deconstruct and dispose of the cableway structure at Texas Creek Site as noted in the contract documents.

3.2 The contractor will separate and dispose of materials as required by law and regulations of authorities having jurisdiction and in accordance with Waste Diversion Plan (WDP) and its classified divisions of materials. Refer to Section 01 74 19 Waste Management and Disposal for requirements.

5. DECONSTRUCTION PLANNING

5.1 Provide Departmental Representative with a Deconstruction Plan which includes:

.1 Quantities for materials to be salvaged for reuse, recycled and sent for disposal.
.2 Destination of materials listed above.
.3 Deconstruction detailed methodology and sequencing.
.4 Schedule for deconstruction.
.5 Location, security and protection of storage areas (if materials are to be stored on site).
.6 Details on materials handling and removal procedures on project sites with space constraints where applicable.

6. SAFETY REQUIREMENTS

6.1 Do all deconstruction work according to the requirements of the WorkSafeBC OHS Regulation.

6.2 Provide one person on site who is responsible for maintaining the safety signage, barriers and protection of the workers and the public. Provide the name of this person to the Departmental Representative. Any changes in personnel must also be reported to the Departmental Representative. Post safety regulations clearly on site.

6.3 A safety plan must be established and reviewed by the Departmental Representative prior to the work.

6.4 Erosion and Sedimentation Control: the Contractor shall ensure that adequate measures are taken to control runoff from the site and to control erosion and comply with applicable by-laws and regulations. To provide environmental stewardship and to minimize site and surrounding area contamination, prepare a sediment control plan and procedures prior to commencing the work.

Provide “Drain Protection Inserts” to comply with Storm water Pollution Prevention Plans and Storm water. The contractor is to protect storm drains, systems and catch basins. Intervention is required to catch oil and sediment headed into storm drains and sewers. The Drain Protection Inserts are to be equipped with an oil-absorbent media in a screened bag, to guard against any potential discharge.

6.5 Provide dust control by spraying water into the air around the work and making the work wet with water. Prevent spread of flying particles and dust. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum, sweep or dust the work area daily if debris may cause environmental or health and or safety hazard if it were to leave the site do to environmental conditions.

7. EXISTING CONDITIONS

7.1 Accept the site as it exists and be responsible for all deconstruction work as required.

7.2 Where non-visible (i.e., concealed by other materials) conditions upon exposure, are revealed to be other than those indicated in the Contract Documents, immediately inform the Departmental Representatice, should such variance of conditions result in a contemplated change to the cost of the work. Should an alternate method of deconstruction or change of materials be appropriate, the Departmental Representative will give his decision before the Work proceeds.

7.3 If during the course of deconstruction Work, the Contractor observes or suspects the existence of hazardous materials in areas of the structure not previously noted, the Contractor shall immediately stop Work in the immediate area and notify the Departmental Representative. And if directed by the Departmental Representatice, remove hazardous materials in a manner consistent with the Occupational Health & Safety Regulation, General Hazard Requirements of the Workers' Compensation Board of the Province having jurisdiction, and other applicable regulations.

7.4 Handle and dispose of all hazardous and banned materials in accordance with the Special Waste Regulation, and Regional and Municipal regulations. These hazardous and banned materials include but are not limited to asbestos, underground storage tanks, Polychlorinated Biphenyls (PCBs), abandoned chemicals (gasoline, pesticides, herbicides, flammable and combustible substances), Freon from cooling equipment, lead-based paints, smoke detectors, and mercury containing switches.

7.5 Prior to start of deconstruction work, arrange for a "TAKE-OVER INSPECTION" with the Departmental Representative. Examine existing adjacent surrounding site perimeter and its public side walk and landscaping but not limited to all exterior surfaces and surrounding areas, record any visible damages in writing or by taking of pictures, to avoid disputes over whether damages already existed or were caused by the demolition.

8 PROTECTION

8.1 Conduct operations with minimum interference to public or private accesses. Maintain protected egress and access at all times.

8.2 Prevent movement, settlement or damage to adjacent structures, services, walks, paving, trees, landscaping and adjacent grades. Provide bracing and shoring as required. Make good damage caused by REMOVAL FROM SITE, demolition or de-construction. Cease operations immediately if adjacent structures appear to be in danger. Notify Departmental Representative. Do not resume operations until directed by Departmental Representative.

8.3 The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. Include all necessary signs, barricades and screens as required for the safety of the structure, third parties and workmen. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any

cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have the Departmental Representative's approval.

8.4 Provide necessary temporary weather protection if and when required to protect the existing services from weather damage.

8.5 Protect site improvements such as sidewalks, curbs, existing landscaped and asphalt areas that lie along the path of removal.

8.6 Prevent debris from blocking items including, but not limited to, surface drainage inlets and systems, mechanical and electrical systems which must remain in operation.

8.7 Protect temporary connections for emergency lighting, lighting, and fire alarms where applicable as work proceeds.

8.8 Prior to any demolition or deconstruction scope of work the contractor is to provide and erect / mobilize/ maintain – a temporary 1800mm (6' 0") high modular metal fence around the entire site and any dust screens that may be required to protect the existing surrounding neighbourhood. Gates are to suit the contractor need for access and the safe evacuation from the site as per WorkSafe BC or authorizes having jurisdiction.

Co-ordinate fencing and dust screen locations with the Departmental Representative. The gates for vehicular and personal movement must be securable and may be securely locked for safety and limit access to the site.

8.9 Provide and maintain all legal and necessary guards, railing, lights and warning signs during the execution of the work, to fully protect all persons. The ECCC and PWGSC shall be saved harmless from any loss, damage, death or injury occurring due to neglect, carelessness or incompetence of the Contractor, or the handling or condition of his equipment.

8.10 Provide adequate protection for adjacent hard and soft landscaping grounds and structures during the performance of work. Provide necessary screens, covers, and hoardings may be required. Be responsible for all damage incurred due to improper lack of protection.

8.11 Adequately protect all work completed or in progress. Any work damaged or defaced due to failure to provide such protection shall be removed and replaced or repaired, as directed by the Departmental Representative, at no increase in contract price.

8.12 Provide disposal bins with locking covers for valuable metals and lock each night at completion of the day's work.

8.13 Where the work is adjacent to existing trees that are to remain a minimum of 300mm of

bark mulch must be laid down to form a pathway for equipment to operate on. Remove the bark mulch at the completion of the work and restore the landscaping.

8.14 In addition to previously listed fire and safety rules to be observed in performance of work, include following:

a) Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.

b) Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.

9. MATERIAL HANDLING

9.1 Material Handling Procedures: Prevent contamination of materials to be salvaged and handle materials consistent with requirements for acceptance by designated facilities. Refer to Section 01 74 19 – Waste Management and Disposal.

9.2 Materials to be salvaged shall be handled in the same manner as for similar new materials.

10. COORINDATION AND COOPERATION

10.1 The Contractor shall take every common and reasonable precaution to avoid damage and minimize interruption to adjacent property and services. All costs associated with making good any damage and/or providing temporary service or protection shall be borne by the Contractor.

11. SUBMITTALS

11.1 Submit deconstruction plan and detailed methodology signed and sealed by a professional engineer registered in British Columbia for review and approval prior to start of work.

12. ACCEPTANCE

12.1 No additional sums of money will be allowed for any items resulting from lack of familiarity with the site conditions. Report any discrepancies to the Departmental Representative.

13. BLASTING

14.1 No blasting is permitted on site.

14. MATERIALS

15.1 Unless specified otherwise, all deconstruction materials forming part of this section shall become the property of the Contractor and shall be removed from the site and disposed of in a legal manner.

15.2 All materials or equipment not specifically described but required for the proper completion of the work of this section shall be selected by the Contractor subject and may be subject to the approval of Departmental Representative.

15 EXAMINATION

15.1 Prior to performing any work, carefully examine all existing conditions. Determine items to be removed. Determine an orderly sequence for the performance of deconstruction work.

16 PREPARATION

16.1 Mark locations of all utilities.

16.2 Arrange for the permanent disconnection of all water, sewer, plumbing, mechanical, electrical, telephone service or other service lines in the area to be demolished only, as per rules and regulations of authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized during construction period to serve other areas.

16.3 Shut-off, disconnect, cap-off and seal all plumbing, mechanical, and electrical services, in accordance with the requirements of the authorities having jurisdiction, before staring deconstruction. All underground utility work is to be completed as per Worksafe BC rules and regulations.

16.4 Perform pest control prior to start of Deconstruction.

16.5 The General Contractor will be required to coordinate the abatement of the hazardous materials from the structure. A site-specific hazardous materials abatement Scope of Work and Safe Work Procedures are required in accordance with WorkSafe BC Occupational Health and Safety Regulations and are provided.

16.6 Health and Safety Regulations. Workers performing any disturbance or removal of hazardous building materials must be adequately trained and qualified to do so or supervised by a qualified experienced hazardous materials contractor. If changes to the planned scope of work are required, the Departmental Representative must be notified immediately to determine if additional testing of suspect materials is warranted.

16.7 The contractor is to have a Spill Kit on site and trained personal to take action to deploy it

if required to mitigate contamination of the site by petroleum products.

17. DECONSTRUCTION (GENERAL)

17.1 Remove from site the cableway structure as noted in the contract drawings, including the removal of portion of the foundations 300mm below the ground.

17.2 The temporary stockpiling of deconstructed materials or fill is permitted on site until they are of a mount suitable for transportation off of the site. Stockpiled fill should be stored on and under polyethylene sheeting to control dust, migration of contamination, etc. All deconstruction materials and recyclables must be removed from site in a timely manner. Dispose of all materials in a legal manner at appropriate designated vendors certified to handle that material.

17.3 At the end of each day's work, leave work in safe condition.

17.4 Demolish concrete in a manner to minimize dust.

17.5 Report any contaminated or dangerous materials found on site and have the hazardous materials contractor dispose of them in a safe manner to minimize danger at site or any time during the deconstruction / demolition. Conform to Section 02 83 11 - Lead Base Paint Abatement Precautions and to all Regulatory Authorities having jurisdiction.

18. CLEAN UP

18.1 Upon completion of demolition, remove equipment and debris.

END OF SECTION 02 41 16

1.0 GENERAL

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following Work:

.1 Removal of lead based paint from cableway structure within the project area.

1.2 RELATED REQUIREMENTS

.1 Structure Deconstruction — Section 02 41 16

1.3 REFERENCES

.1 Department of Justice Canada

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 Health Canada

.1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).

.3 Human Resources and Social Development Canada (HRSDC)

.1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.

.4 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.5 U.S. Environmental Protection Agency (EPA)

.1 EPA 747-R-95-007- 1995, Sampling House Dust for Lead.

.6 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)

.1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).

.7 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances

.1 Lead in Construction Regulation - 29 CFR 1926.62- 1993.

.8 BC Occupational Health and Safety Act, WorkSafe BC.

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Authorized Visitors: Departmental Representative and representatives of regulatory agencies.

.3 Occupied Area: areas of work site.

.4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

.5 Airlock: ingress or egress system, without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.

.6 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows:
- .1 Place two overlapping polyethylene sheets over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one sheet along one vertical side of doorway, and secure other sheet along opposite vertical side of doorway.
- .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
- .3 Overlap each polyethylene sheet at openings 1.5 m on each side.

.7 Action level: employee exposure, without regard to usage of respirators, to an airborne concentration of lead of 50 micrograms per cubic meter of air calculated as 8 hour time-weighted average (TWA). Intermediate precautions for lead abatement are based on airborne lead concentrations greater than 0.05 milligrams per cubic meter of air within Work Area.

.8 Competent person: Professionals capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.

.9 Lead in Dust: wipe sampling on vertical and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.5 ACTION & INFORMAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.

.3 Provide: Provincial Territorial and local requirements for Notice of Project Form.

.4 Provide proof of Contractor's General and Environmental Liability Insurance.

.5 Quality Control:
- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that it has been received and properly disposed.
- .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
- .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one supervisor for every ten workers.

.6 Product data:
- .1 Provide documentation including test results, fire and flammability data, and Material

Safety Data Sheets (MSDS) for chemicals or materials including:
- .1 Encapsulants.
- .2 Amended water.
- .3 Slow drying sealer.

.7 Submit Exposure Control Plan as per requirement in Worksafe BC Part 6.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

.2 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers and visitors in Work Area includes:

.1 Respirator NIOSH approved and equipped with filter cartridges with assigned protection factor of 50, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.

.2 Disposable type protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

.2 Requirements for workers:

.1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.

.2 Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in Work Area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from Work Area or from Equipment and Access Room.

.3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not to use this system as means to leave or enter work area.

.3 Eating, drinking, chewing, and smoking are not permitted in Work Area.

.4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.

.5 Ensure workers wash hands and face when leaving Work Area. Facilities for washing are located as indicated on drawings.

.6 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.7 Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.

.8 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to Work Areas.

.2 Instruct Authorized Visitors in use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.7 WASTE MANAGEMENT & DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

.2 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.3 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project is appended in Appendix A of this specifications.

.2 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 SCHEDULING

.1 Not later than two days before beginning Work on this Project notify the following in writing,

where appropriate:

.1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
.2 Provincial Ministry of Labour.
.3 Disposal Authority.

.2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.

.3 Provide Departmental Representative copy of notifications prior to start of Work.

.4 Hours of Work: perform work in accordance with Section 01 11 55 General Instructions. Include in Contract Sum additional costs due to this requirement.

1.10 QUALIFICATIONS

.1 Abatement Contractor must have at least 5 years of experience in similar scope and nature of work. Qualifications and resume of personnel involved must be submitted to Departmental Representative for approval.

2.0 PRODUCTS

2.1 MATERIALS

.1 Polyethylene: 0.15 mm unless otherwise specified; in sheet size to minimize joints.

.2 FR polyethylene: 0.15 mm reinforced fabric bonded both sides with polyethylene.

.3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.

.4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for trapping residual lead paint residue.

.5 Lead waste containers: metal fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm sealable polyethylene liners.

.1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

3.0 EXECUTION

3.1 SUPERVISION

.1 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead based paints.

3.2 PREPARATION

.1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.

.2 Work Area:

.1 Pre-clean fixed casework, and equipment within work areas, using HEPA vacuum and

cover with polyethylene sheeting sealed with tape.

.2 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum.

.3 Cover surfaces in work area with FR polyethylene drop sheets to protect existing ground/surface during removal.

.4 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.

.5 At point of access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used:

.1 CAUTION LEAD HAZARD AREA (25 mm).

.2 NO UNAUTHORIZED ENTRY (19 mm).

.3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm).

.4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).

.6 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.

.7 Where water application is required for wetting lead containing materials, provide temporary water supply by use of appropriately sized hoses for application of water as required.

.8 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.3 Worker Decontamination Enclosure System:

.1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:

.1 Equipment and Access Room: construct between exit and work areas, with two curtained doorways, one to the rest of suite, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change comfortably.

.2 Clean Room: construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.4 Construction of Decontamination Enclosures:

.1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two layers of FR polyethylene on floor.

.2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.5 Separation of Work Areas from Occupied Areas
- .1 Barriers between Work Area and occupied area to be constructed as follows:
  - .1 Construct floor to ceiling lumber metal stud framing, cover with polyethylene sheeting and seal with duct tape. Apply 9 plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
  - .2 Cover plywood with polyethylene sheeting and sealed with duct tape.

.6 Maintenance of Enclosures:
- .1 Maintain enclosures in clean condition.
- .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
- .3 Visually inspect enclosures at beginning of each work day.
- .4 Use smoke test method to test effectiveness of barriers as directed by Departmental Representative.

3.3 LEAD-BASE PAINT ABATEMENT

.1 Removal of lead based paint to be performed by scraping or sanding using non-powered hand tools, or manual demolition of lead-painted plaster walls or building components by striking a wall with sledgehammer or similar tool.

.2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean work area including equipment and access room, and equipment used in process. After inspection by Departmental Representative, apply continuous coat of slow drying sealer to surfaces. Do not disturb work for 8 hours with no entry, activity, ventilation or disturbance during this period.

.6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

3.4 INSPECTION

.1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will

result in work stoppage, at no cost to PWGSC.

.2 Departmental Representative will inspect work for:
- .1 Adherence to specific procedures and materials.
- .2 Final cleanliness and completion.
- .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.3 When lead dust leakage from Work Area occurs Departmental Representative may order Work shutdown.
- .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 LEAD SURFACE SAMPLING-WORK AREAS

.1 Final lead surface sampling to be conducted as follows:
- .1 After Work Area has passed a visual inspection for cleanliness approved by Departmental Representative and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of 8 hours has passed. Departmental Representative will perform lead wipe sampling in Work Area.
  - .1 Final lead wipe sampling results from horizontal and vertical surfaces where lead based paints have been removed must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples must be collected and analyzed in accordance with EPA 747-R-95-007.
  - .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
  - .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEAN-UP

.1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum equipment.

.3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labeled waste containers for transport.

.4 Clean-up Work Areas, Equipment and Access Room, and other contaminated enclosures.

.5 Clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.

.6 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

3.7 RE-ESTABLISHMENT OF OBJECTS & SYSTEMS

.1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

END OF SECTION 02 83 11

PART 1: GENERAL

1.1 n/a

PART 2: PRODUCTS

2.1 Materials

.1 Native Material Fill: Will be considered but must be reviewed and approved by either the project Departmental Representative or should a Departmental Representative not be part of the project team a Departmental Representative engaged by the Contractor at no cost to PWGSC.

.2 Review and approvals by a Departmental Representative engaged by the Contractor shall be signed and sealed and submitted to the Departmental Representative prior to use of this material.

.3 Pit Run Gravel: To be well graded granular material, substantially free from clay lumps, organic matter and other extraneous material, screened to remove all stones in excess of maximum diameter specified in material description.

Sieve Size (mm)	Percent Passing
75	100
50	70-100
25	50-100
4.75	22-100
2.36	10-85
0.075	2-8

.4 Crushed Granular Sub Base: Shall be 75 mm (3”) minus, clean, granular material free of organic material conforming to following gradation limits:

Sieve Size (mm)	Percent Passing
80	100
75	55-100
38	60-100
19	35-80
9.5	26-60
4.75	20-40
2.36	15-30
1.18	10-20
0.6	5-15
0.3	3-10

0.075	0-5

.5 Granular Base: The 19 mm (3/4") crushed granular base course shall consist of sound, durable particles, free from clay, organic material or other deleterious matter, evenly graded, to meet the following gradation requirements.

Sieve Size (mm)	Percent Passing
19	100
12.5	75-100
9.5	60-90
4.75	40-70
2.36	27-55
1.18	16-42
0.60	8-30
0.30	5-20
0.15	5-15
0.074	2-8

.6 River Sand: River sand to be free of organic material, salt and foreign objects and conform to the following gradation:

Sieve Size (mm)	Percent Passing
19	100
4.75	80-100
0.6	20-80
0.15	0-20
0.075	0-8

PART 3: EXECUTION

3.1 Excavation

.1 Grade to elevations and dimensions indicated on contract documents or required by the work of this section or related sections.

.2 Ensure that work of this section provides sufficient space to permit erection of forms, site elements and miscellaneous elements of related sections.

.3 Excavation shall to ensure that the placement of fill materials are minimized.

.4 Contractor shall phase his operation so that a stable slope at the edge of excavation is maintained all times. Where sloping of the sides of excavations are not possible the Contractor shall implement appropriate safety measures in accordance with current WorkSafe BC requirements.

.5 During excavation, stockpile material suitable for backfill in a neat manner and sufficient distance from the trench to avoid slides and cave-ins.

.6 All excavated materials not required or suitable for backfill shall be removed and wasted as indicated or as directed. Grade as required to prevent surface water from flowing into trenches or other excavations. Remove any accumulated water by pumping or other approved method.

.7 All exposed excavation faces shall be protected from weather with appropriate tarps or plastic sheeting as soon as possible after being cut.

.8 Remove all boulders, rock and stones larger than 150 mm (6") in diameter from excavated surfaces encountered during excavation. Fill cavities created with crushed granular base course material compacted to 95% Modified Proctor Density.

.9 Bottom of excavation to be level, free from loose material and debris.

.10 Protect excavations against freezing. Frozen areas shall be thawed and protected from further frost until subsequent work has been completed.

.11 All necessary precautions shall be taken to preserve all materials outside the required excavations in an undisturbed condition.

.12 Costs incurred as a result of deterioration caused by activities or neglect of the Contractor or and fill required for over excavation as a result of action by the contractor are the responsibility of the contractor.

3.2 Placement of Granular Fill Material

.1 Place granular fill material in maximum 300 mm (1'-0") lifts to depths indicated on drawings. Compact each lift to 95% Modified Proctor Density.

.2 Ensure that granular fill material is placed to the full width of the excavation, in uniform lifts, shaping each lift to smooth, even contours.

.3 Apply water as necessary during compaction to obtain specified density. If material is excessively moist aerate by scarifying with suitable equipment until moisture content is suitable for compaction.

.4 Mechanical compaction equipment shall be used with extreme caution to prevent any undue pressure on foundation work. Do not use motorized compaction equipment directly adjacent to foundation or retaining walls.

.5 Where backfill is required on both sides of foundation walls it shall be placed and compacted simultaneously on both sides of the wall.

.6 All sub grade whether disturbed or undisturbed, shall be compacted to 95% Modified Proctor Density.

.7 Soft areas or areas that do not meet specified compacted densities shall be over excavated and filled with compacted crushed granular base course as required to obtain the specified compaction density.

.8 All backfill shall be placed to within 300mm of finished grade, and the top 300mm up to finished grade shall be sodded growing medium. The layer beneath the growing medium shall be 500mm of River Sand beneath which there shall be successive layers of at least 500mm of Granular Sub-Base and the remainder beneath shall be Pit Run Gravel (depth will vary).

3.3 Grading Subgrade and Granular Fill

.1 Site sub grade shall be shaped to lines and elevations indicated on contract drawings.

.2 Finished surface of sub grade and granular fill material shall have no irregularities exceeding 10 mm (3/8") when checked with a 3 M straight edge placed in any direction. Correct all sub grade and granular fill surface irregularities by loosening and adding or removing sub grade or granular fill material until surface is within specified tolerance. Correcting sub grade deficiencies by manipulating granular fill material is not acceptable.

.3 Shaping of sub grade shall ensure uniform slope transitions with rounded, smooth profiles between changes in elevations

.4 Ensure that sub grade preparation allows for depth of granular fill and finished materials as indicated on contract drawings.

3.4 Dewatering

.1 Pump or otherwise continuously remove all water that has accumulated in excavation during the progress of the Work.

.2 Do not divert water onto adjacent property.

.3 Ensure that sediment control devices are in place as per municipal or provincial regulations prior to the start of dewatering operations. Do not divert dewatering effluent to natural water bodies.

3.5 Clean Up

.1 Clean up and remove from the site, as the work proceeds any debris and waste material or rubbish resulting from the work of this section.

.2 Transport all surplus excavated materials, fill materials, and debris off site to an approval disposal area.

END OF SECTION 31 23 10

APPENDIX A

ENVIRONMENTAL ASSESSMENT

BIRCHBANK CABLEWAY DECONSTRUCTION PROJECT

Prepared for:
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Project No. 2016425(4A)
Draft submitted December 2016
Final submitted February 2017

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1 BACKGROUND

In October 2016, AquaTerra Environmental Ltd. ('AquaTerra') was retained by Public Works and Government Services Canada (PWGSC) on behalf of Environment and Climate Change Canada (ECCC) to complete a detailed Environmental Assessment (EA) for the Birchbank Cableway Deconstruction project (the 'project'), located approximately 7 km north of Trail BC (54° 00' 40" N; 122° 37' 00" W) as illustrated in **Figure 1.**

The Birchbank Cableway was built in 1937 for taking sediment samples and flow measurements and were deemed unsafe to operate between 1998 and 2007, becoming redundant with the emergence of new technologies. The Birchbank towers are located approximately 7 km north of Trail (**Figure 1**). The towers support a 1 ¼" bridge strand spanning 316 m across the Columbia River. The intention of the project is to dismantle and dispose of the cable way and salvage the towers and cables in an environmentally appropriate manner. The current decommissioning strategy is to lower the cable into the water followed by the removal of each tower.

FIGURE 1: Approximate Site Location (Illustrated in Red).

This EA will be utilized by ECCC personnel (and is to be made available to contractors as part of the bidding package) to ensure that aquatic and terrestrial habitats as well as potential sensitive receptors are adequately assessed and mitigated for during cableway deconstruction. Specifically, this EA is intended to:

1. summarize existing aquatic and terrestrial habitats within the site area boundaries;
2. document observed aquatic and terrestrial wildlife / vegetation species;
3. identify and discuss relevant wildlife features / habitats;
4. identify and discuss relevant aquatic features / habitats;
5. evaluate the potential for sensitive[1] species occurrence;
6. provide appropriate project-specific mitigation measures to be considered and implemented during the design and physical deconstruction phases; and
7. provide recommendations to be adhered to tower deconstruction works.

2 OBJECTIVES

The primary objectives of this EA are to accurately describe existing aquatic and terrestrial habitat conditions at the site and to evaluate potential impacts relating to cableway decommissioning and developing appropriate mitigation strategies, as applicable, to minimize potential risks and residual effects that can be implemented during the design and construction phases.

3 EXISTING PROJECT AREA CONDITIONS

The project area consists of the two towers, associated anchors and immediately surrounding areas (to a distance of approximately 50 m from the tower footprints) at the Birchbank site.

The west tower is situated at 447669E; 5447413N and is approximately 20 m in height. The concrete footings (n=4) are approximately 2 m high and 0.8 m x 0.8 m in width. The distance between the tower and the rail line is approximately 38 m, with the anchor being situated approximately 8 m to the rail line. In addition to the anchor, two guy wires to the east stabilize the western tower. The distance between the tower and the high water mark / top-of-bank of the Columbia River is approximately 15-20 m.

The east tower, situated at 447963E; 5447374N, consists of two (2) footings, 2 guy wires and one anchor. The tower is approximately 13.5 m in elevation and the concrete footings measure approximately 0.8 m x 0.8 m with a height of approximately 0.8 m. The east tower is situated atop the crest of the slope down to the Columbia River and is set back approximately 15-20 m from the top-of-bank. The slope down to the river measures approximately 26 m at a gradient of approximately 50°.

[1] Defined as provincially red and blue-listed species and federally ranked Species-at-Risk.

Both the east and west towers were sampled for lead paint, which confirmed the presence of lead as discussed in detail in Section 9.

4 BACKGROUND SEARCH RESULTS

Prior to the onset of field work, accessible federal, provincial and public databases and mapping utilities were queried to collect pertinent biophysical information associated with the site. Results are provided in the following sections.

4.1. Species at Risk (http://sararegistry.gc.ca) and Species at Risk and Local Government – A Primer for British Columbia (http://ww.speciesatrisk.bc.ca)

The federal species-at-risk and species-at-risk / local government databases were queried on 10 October 2016 to evaluate the potential for federally-listed endangered, threatened and/or special concern species to occur on-site. The following Schedule 1, Schedule 3, and COSEWIC (Committee on the Status of Endangered Wildlife in Canada) listed species were listed as potentially occurring on-site based on available habitat types observed during the field survey (Section 7):

Mammals

- American Badger (*Taxidea taxus*) - Endangered
- Caribou Southern Mountain Population (*Rangifer tarandus* pop.1) - Endangered
- Fringed Myotis (*Myotis thysanoides*) – Data Deficient
- Grizzly Bear (*Ursus arctos*) – Special Concern
- Little Brown Myotis (*Myotis lucifugus*) - Endangered

Birds

- Barn Swallow (*Hirundo rustica*) - Threatened
- Common Nighthawk (*Chordeiles minor*) - Threatened
- Flammulated Owl (*Psiloscops flammeolus*) – Special Concern
- Lewis's Woodpecker (*Melanerpes lewis*) – Threatened
- Olive-sided Flycatcher (*Contopus cooperi*) – Threatened
- Short-eared Owl (*Asio flammeus*) – Special Concern
- Western Screech Owl (*Megascops kennicottii macfarlanei*) – Threatened
- Yellow-breasted Chat (*Icteria virens*) - Endangered

Reptiles and Amphibians

- Rubber Boa (*Charina bottae*) – Special Concern
- Western Rattlesnake (*Crotalus oreganus*) – Threatened
- Western Skink (*Plestiodon skiltonianus*) – Special Concern

- Western Toad (*Anaxyrus boreas*) – Special Concern
- Western Yellow-bellied Racer (*Coluber constrictor*) – Special Concern

Fish

- Columbia Sculpin (*Cottus hubbsi*) – Special Concern
- Bull Trout (*Salvelinus confluentus*) – Special Concern
- Shorthead Sculpin (*Cottus confusus*) – Special Concern
- Umatilla Dace (*Rhinichthys umatilla*) – Threatened
- White Sturgeon (*Acipenser transmontanus* pop. 2) (Columbia River Population) - Endangered

Invertebrates

- Monarch (*Danaus plexippus*) - Threatened

Based on existing habitat types on-site, sensitive mollusk, vascular plants, lichen and moss species at are not anticipated to occur on-site. A detailed discussion of federally-listed sensitive species potentially occurring at the site is included in Section 8.

4.2. Conservation Data Centre (http://www.env.gov.bc.ca/cdc/)

The BC Conservation Data Centre (CDC) database was queried on 10 October 2016 to obtain details on known occurrences of rare animal species or plant communities for the site and surrounding areas. The CDC is part of the Wildlife Inventory Section of the Resource Inventory Branch of the BC Ministry of Environment (MOE) that uses a listing process to identify species that are candidates for legal designation as extirpated, endangered or threatened (**Red Listed**), as well those species that are considered to be of special concern (**Blue Listed**).

The CDC results identified five (5) non-sensitive elemental occurrence records within approximately 5 km of the site, which are summarized in **Table 1**. The potential for these species to occur within or adjacent to the site is discussed in Section 8. CDC mapping results are provided in **Appendix A.**

Table 1: BC Conservation Centre Results – Organized by Distance from Site

Shape ID	Common Name	Scientific Name	Provincial Ranking*	Observed Location	Distance from Site	Last Observed
11261	White Sturgeon	*Acipenser transmontanus* pop.2	Red	Columbia River below Keenley Dam	Adjacent to site	2000
29997	Western Skink	*Plestidon skiltonianus*	Blue	Billy Creek	4.5 km south of site	2005
11289	Umatilla Dace	*Rhinichthys umatilla*	Red	China Creek	3.5 km north of site	1989

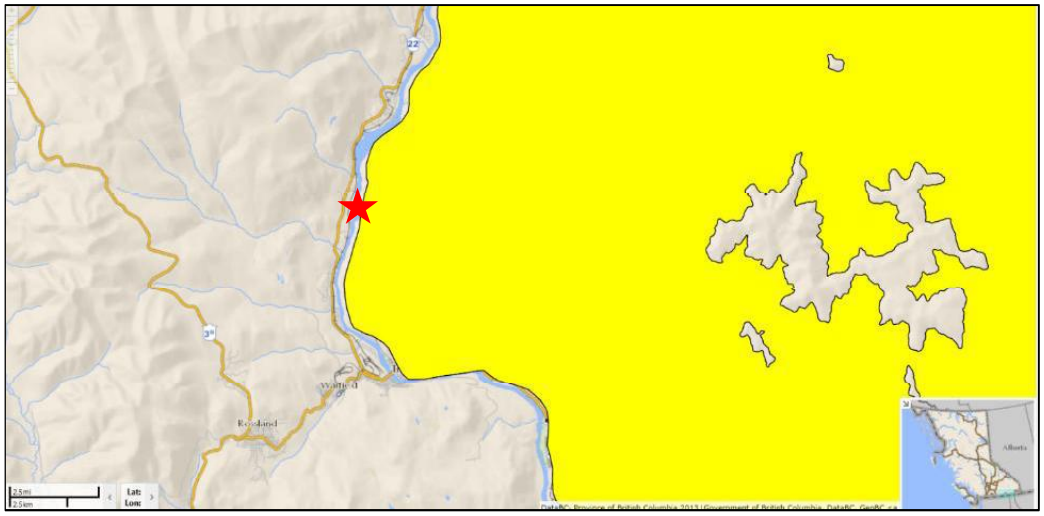
Table 1: Con't.

Shape ID	Common Name	Scientific Name	Provincial Ranking*	Observed Location	Distance from Site	Last Observed
31424	Western Screech-owl	*Megascops kennicottii macfarlanei*	Red	Genelle	5.0 km north	2010
4004	Umatilla Dace	*Rhinichthys umatilla*	Red	Columbia River opposite Cominco	6.5 km south	1984

4.3. BC iMAP (http://webmaps.gov.bc.ca/imfx/imf.jsp?site=imapbc)

The BC iMAP database and mapping utility was queried on 10 October 2016. Query results confirm that the eastern portion of the site (east tower) is situated within the critical habitat polygon for Caribou – Southern Mountain Population (**Figure 2**). The site is also situated within the Grizzly Bear South Selkirk Population Unit (east side of Columbia River) and the Kettle Granby Population Unit (west side of Columbia River). Columbia River is not ranked as a fisheries sensitive watershed and no ungulate winter range or proposed Wildlife Habitat Areas (WHAs) were identified for the site.

Figure 2: Caribou – Southern Mountain Population – Relative to the Site (Red Star).



The Woodland Caribou Recover Strategy identifies the population (Southwest Kootenay) as being comprised of approximately 33 individuals (as of 2013) and are in decline. Largest risks to this population appear to be related to oil and gas drilling, agricultural, transportation/service corridors, hunting, forestry and human intrusion / disturbance.

4.4. Fisheries Information Summary System (FISS)

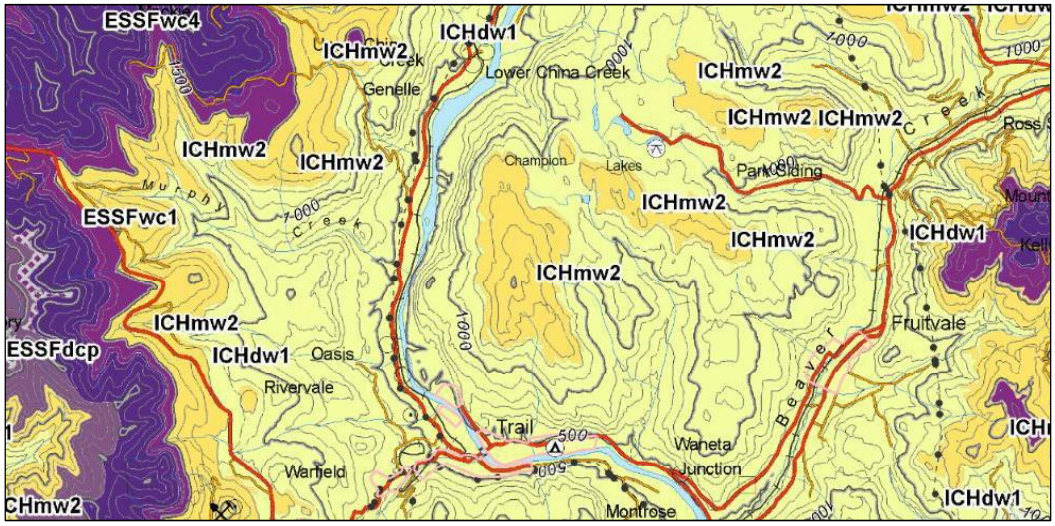
(http://www.env.gov.bc.ca/fish/fiss/)

The Columbia River (watershed code: 300) consists of a number of potentials and constraints including diseased stocks, stocking with non-native species, water quality issues relating to sewage disposal, elevated lead levels, parasitized stocks, pulp mill effluent issues, limited rearing habitat, and rapidly fluctuating flows. Confirmed fish presence includes White Sturgeon, Brook Trout, Longnose Dace, Redside Shiner, Rainbow Trout, Brown Trout, Mountain Whitefish, Walleye, Northern Pike, Bull Trout, Tench, Yellow Perch, Cutthroat Trout, Sculpin (including Prickly, Columbia, Mottled, Shorthead, Slimy and Torrent), Largescale Sucker, Northern Pikeminnow, Kokanee, Peamouth Chub, Longnose Sucker, Burbot, Umatilla Dace, Lake Whitefish, Smallmouth Bass, Carp, Pygmy Whitefish, Lake Trout, Bridgelip Sucker, Pumpkinseed, Northern Mountain Sucker, Chiselmouth, Westslope Cutthroat Trout, Leopard Dace, Lake Chub, Dolly Varden, Chinook Salmon, and Steelhead.

5 BIOGEOCLIMATIC ZONE

The site lies within the Interior Cedar – Hemlock (ICH) biogeoclimatic zone (**Figure 3**), which covers approximately 5.5% of the province and has a continental, cool to warm temperature climate. The winters are cool and summers are warm and dry with a 3-5 month growing season. The zone has a mean annual temperature of 3.3 oC and annual precipitation of 780 mm. Temperature of the warmest month varies between 21.8°C to 24.6 °C with an average of 23.1 °C. ICH consists of 11 subzones, which show considerable variation in vegetation assemblage from the driest through to the wettest areas. Applicable to the site is the ICH Dry Warm subzone (ICHdw), which occurs in valley bottoms and the lower slopes of the Columbia River. Elevation range is 450 to 1200 m (south aspect). Snowpacks are very shallow and of very short duration, and the soils generally do not freeze because of the mild climate. Moisture is one of the major limitations to tree growth.

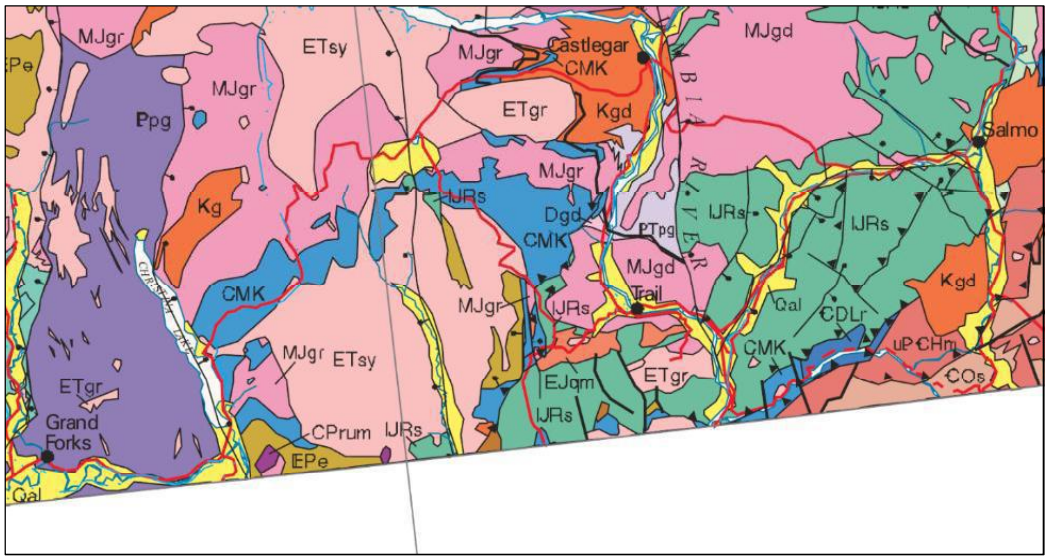
Figure 3: Site Biogeoclimatic Zone



6 SURFICIAL GEOLOGY

The surficial geology is characterized as Quaternary cover (code Qal), consisting of alluvium, glaciofluvial gravels as well as sand and till (2005 BC Geological Survey; **Figure 4**).

Figure 4: Local and Regional Surficial Geology



7 FIELD SURVEY RESULTS

On 11 October 2016, Mr. Chris Lee of AquaTerra Environmental Ltd., accompanied by Ms. Viera Veidner of PWGSC, conducted a detailed habitat assessment to evaluate natural aquatic and terrestrial features, confirm background review findings, and inventory common and sensitive (if any) plant and animal species. Significant habitat and wildlife features were recorded via GPS. Site photographs are provided in **Appendix 2.**

7.1 Aquatic Habitat

The Columbia River is situated within 30 m of the project area and has a typical wetted width of approximately 200 m with a bankful width of approximately 220 m. River substrate adjacent to the project area is dominated by cobble (80%) with lesser amounts of boulders (<5%), gravel (10%) and fines (5-10%). The river is utilized by a number of salmonid and coarse fish species, which are discussed in detail in Section 4.4.

7.2 Riparian and Terrestrial Habitats

The western tower site consists of 'mixed forest' and is dominated by Black Cottonwood (*Populus balsamifera*), Ponderosa Pine (*Pinus ponderosa*) and Paper Birch (*Betula papyrifera*) with a 10-20% canopy cover. The eastern tower site consists of 'open coniferous forest' and is dominated by Ponderosa Pine with a minor amount of Western White Pine (*Pinus monticola*) (<5%), with a 50-60% canopy cover. A comprehensive list of observed vegetation is summarized in **Table 2.** No sensitive habitats were observed within the vicinity (i.e., within 30 m) of the existing or proposed reservoir footprints.

Table 2: Vegetation Observed within the Project Area.

Common Name	Scientific Name	West Tower Site	East Tower Site
TREES			
Black Cottonwood	*Populus balsamifera*	✓	
Paper Birch	*Betula papyrifera*	✓	
Ponderosa Pine	*Pinus ponderosa*	✓	✓
Western White Pine	*Pinus monticola*		✓
SHRUBS			
Tall Oregon Grape	*Mahonia aquifolium*	✓	✓
Saskatoon	*Amelanchier alnifolia*	✓	
Common Snowberry	*Symphoricarpos albus*	✓	
Falsebox	*Paxistima myrsinites*	✓	
HERBS / MOSSES			
Bracken Fern	*Pteridium aquilnum*	✓	

Table 2: Con't.

Common Name	Scientific Name	West Tower Site	East Tower Site
Prince's Pine	*Chimaphila umbellata*	✓	
Yarrow	*Achillea millefolium*	✓	
Red-stemmed Feathermoss	*Pleurozium achreberi*		✓

7.3 Terrestrial Wildlife

A summary of terrestrial wildlife or terrestrial wildlife sign observed during the detailed field survey on 05 July 2016 are outlined in the following sections.

7.3.1 Common Wildlife

A summary of common wildlife species including mammals, birds, amphibians and reptiles, and invertebrates observed and potentially occurring within the site boundaries are discussed below.

7.3.1.1 Mammals

No mammals were directly observed during the detailed field survey; however, mammal signs were observed at numerous locations. Specifically, Black-tailed Deer (*Odocoileus hemionus* ssp. *columbianus)* forage signs were observed near the access road. Black Bear (*Ursus americanus*) sign was observed along the access road. Signs of small rodents were also observed, likely Townsends Vole (*Microtus townsendii),* Yellow-Pine Chipmunk (*Tamias amoenus*), and Douglas's Squirrel (*Tamiasciurus douglasii*).

7.3.1.2 Birds

Birds observed during the detailed assessment are summarized in **Table 3.** No active or inactive nests were observed.

Table 3: Bird Species Identified During the 11 October 2016 Assessment

Common Name	Scientific Name	Bird Code	Count	Behaviour	Nest Observed (Y/N)
Common Raven	*Corvus corax*	CORA	2	Fly-over / calling	N
Ruffed Grouse	*Bonasa umbellus*	RUGR	2	Foraging	N

The low number and diversity of birds observed is anticipated to be the result of weather conditions during the assessment (isolated, heavy showers). Additionally, some of the terrestrial habitats observed within the site area (i.e., (mature coniferous forest and mature mixed woods) are generally less utilized by birds relative to other habitat types (e.g., riparian habitat).

8 HABITAT SUITABILITY AND POTENTIAL OCCURRENCE RANKING

Development of habitat suitability ratings for potentially occurring species was based on protocols outlined in the document titled 'British Columbia Wildlife Habitat Rating Standards' (MELP 1999). Given the paucity of data for many provincially and federally species at risk (SAR) specific habitat requirements, a four-class ranking system was used. This ranking system employs high (H), moderate (M), low (L) and nil (N) ratings for defined seasons and habitat uses. Ratings reflect the value of a specific habitat type for a specific SAR relative to the best habitat (benchmark) available for this species in the province. Specifically, the benchmark is the highest capability habitat for the species in the province, against which all other habitats for that species are rated. It is used to calibrate the capability and suitability ratings by providing "the standard" for comparing and rating each habitat or ecosystem unit for a particular season and life requisite. The ranking system criteria are summarized in **Table 4.**

Table 4: Adapted Habitat Suitability Rating Scheme for Species at Risk.

% of Provincial Best	Intermediate Knowledge – 4-Class	
	Rating	Code
100-76%	High	H
75-26%	Moderate	M
25-1%	Low	L
0%	Nil	N

Ratings for potentially occurring provincially and federally-listed rare and endangered species within the site boundaries are presented in **Table 5** and are based on habitat suitability ratings, the reviewed background information, BEC zone, and the detailed site assessment findings.

Table 5: Occurrence Ranking for Sensitive Species Potentially Utilizing the Site based on Habitat Suitability Ratings.

Common and Scientific Names	Status[2]	Potential Occurrence Ranking	Rationale
MAMMALS			
American Badger *Taxidea taxus*	Red; EN	**LOW**	Prefers open areas and may also frequent brushlands with little ground cover. Frequently uses forest and coniferous forest, as well as grassland and shrubland.
Caribou *Rangifer tarandus*	Red; EN	**LOW**	IN later winter, utilizes open stands with abundant lichens. Summer habitats are typically in or adjacent to old forests dominated by Subalpine Fir or Engelmann Spruce. Early winter are usually in forests dominated by Western Hemlock and Western Redcedar.
Fringed Myotis *Myotis thysanoides*	Blue; DD	**LOW**	Utilizes middle elevations in desert, riparian, grassland and woodland habitats. Roosts in caves, mines, cliff faces, rock crevices, snags etc. Frequently found in deciduous / coniferous mixed forest as well as conifer dominated forests.

Table 5: Con't.

Common and Scientific Names	Status 2	**Potential Occurrence Ranking**	Rationale
Grizzly Bear *Ursus arctos*	Blue; SC	**LOW-MODERATE**	Utilizes subalpine mountain forests including mixed forests, coniferous forests, grasslands, meadows, riparian and estuarine areas etc.
Little Brown Myotis *Myotis lucifugus*	EN	**MODERATE**	Utilizes a variety of man-made structures as well as caves and hollow trees. Forages over waters including the margins of lakes and streams or in woodlands near water.
BIRDS			
Barn Swallow *Hirundo rustica*	Blue; TH	**HIGH**	Forages over open land and water and nests in barns or other buildings. Prefers open habitats.
Common Nighthawk *Chordeiles minor*	TH	**MODERATE**	Utilizes a variety of habitats including mountains and plans, open coniferous forests, savanna, grasslands, fields, and areas around cities and towns.
Flammulated Owl *Psiloscops flammeolus*	Blue; SC	**HIGH**	Breeds in open coniferous pine forests with an open canopy. Utilizes cavity-bearing snags.
Lewis's Woodpecker *Melanerpes lewis*	Blue; TH	**HIGH**	Breeds in open forest and woodland. Utilizes coniferous forest dominated by Ponderosa Pine, riparian woodland and orchards.
Olive-sided Flycatcher *Contopus cooperi*	Blue; TH	**MODERATE-HIGH**	Breeds in various forest and woodland habitats including mixed coniferous/deciduous forests and subalpine coniferous forests. Most nesting sites contain dead standing trees.
Short-eared Owl *Asio flammeus*	Blue; SC	**LOW**	Utilizes grasslands and riparian areas. Prefers open habitats with low vegetation.
Western Screech-owl *Megascops kennicotti macfarlanei*	Red; TH	**MODERATE**	Frequents conifer dominated as well as mixed forests and riparian areas.
Yellow-breasted Chat Icteria virens	Red; EN	**LOW-MODERATE**	Associated with shrubby and riparian habitats with open canopies and dense subcanopy layers. Prefers deciduous and riparian areas.
AMPHIBIANS AND REPTILES			
Rubber Boa *Charina bottae*	SC	**LOW-MODERATE**	Habitat includes woodlands, forest clearings, meadows, and savannas generally not far from water as well as riparian zones.
Western Rattlesnake *Crotalus oreganus*	Blue; TH	**LOW-MODERATE**	Utilizes areas with exposed bedrock or animal burrows. Most dense are located in the Ponderosa Pine biogeoclimatic zone.
Western Skink *Plestiodon skiltonianus*	Blue; SC	**MODERATE**	Habitats include grassland, chaparral, woodlands, open pine woods, and rocky areas near streams.
Western Toad Anaxyrus boreas	Blue; SC	**MODERATE**	Utilizes a variety of aquatic and terrestrial habitats including shallow, littoral zones, bogs, fens, roadside ditches, riparian zones, and all forest and woodland types, including high elevation sites.
Western Yellow-bellied (North American) Racer Coluber constrictor	Blue; SC	**LOW**	Hibernates in fractured rock outcroppings. Forages in open grassland and shrub dominated habitats but also found in broad forested habitats with clearings.

Table 5: Con't.

Common and Scientific Names	Status[2]	Potential Occurrence Ranking	Rationale
FISH			
Columbia Sculpin *Cottus hubbsi*	Blue; SC	**MODERATE**	Utilizes rocky riffles of creeks and smaller rivers. Known range includes the Columbia River system.
Bull Trout *Salvelinus confluentus*	Blue; SC	**HIGH**	Deep pools in cold rivers and large tributary streams in moderate to fast currents. Utilizes the Columbia River system.
Shorthead Sculpin *Cottus confusus*	SC	**LOW**	Generally found in more upstream habitats and utilizes the lower Columbia River in minor tributaries.
Umatilla Dace *Rhinichthys umatilla*	Red; TH	**HIGH**	Endemic to the Columbia River in productive low elevation waters at depths between 10-169 cm with large gravel/cobble and boulder substrate.
White Sturgeon Pop.2 *Acipenser transmontanus*	Red; EN	**MODERATE**	Part of the Arrow Lakes reservoir (upper Columbia) and Transboundary (lower Columbia) group.
INVERTEBRATES			
Monarch *Danaus plexippus*	Blue; SC	**LOW**	Has been observed in low moist spots in fields, meadows, right of ways, etc., but typically prefers large tracts of undisturbed, natural habitat. Anthropogenic activities (habitat degradation, fragmentation and introduction of invasive species) are thought to be the primary reason for this species decline.

9 LEAD PAINT TESTING AND RESULTS

Two (2) paint samples were collected from each tower (north side and south side) and submitted to an accredited laboratory under sealed chain-of-custody for lead paint analysis. The lead-in-paint results are as follows:

West Tower
North Side: 199,000 mg/kg lead
South Side: 158,000 mg/kg lead

East Tower
North Side: 139,000 mg/kg lead
South Side: 262,000 mg/kg lead

The lead sample results confirm high lead content within the paint for both towers that will require appropriate handling and disposal (discussed in additional detail in Section 10).

10 RECOMMENDATIONS

The following project-recommendations have been developed based on background search results, applicable Best Management Practices (BMPs) and provincial and federal guidelines, as well as lead paint analysis results, and the detailed assessment results, as follows:

1. The project is anticipated to require a federal Fisheries and Oceans Canada (DFO) Project Review and BC *Water Sustainability Act* notification, based on the current deconstruction methodology and discussions with Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) personnel. Typical review periods for a DFO Project Review is approximately 1-2 months, whereas a *Water Sustainability Act* notification can take 45 days. These review times should be built into the project schedule, if deemed necessary.

2. A Species-at-Risk Act (SARA) Permit may be required given that the works are situated within the critical habitat area for the Woodland Caribou – Southern Mountain / Southwest Kootenay population. SARA permits are required for works occurring on federal lands. Although the impacts are anticipated to be negligible; the requirement for a SARA permit should be confirmed well in advance of the works. SARA permits can often take up to 120 days.

3. Follow the lead-containing paints and coatings guidelines set out in the WorkSafeBC Document entitled 'Lead-Containing Paints and Coatings: Preventing Exposure in the Construction Industry'.

4. Consider on-site lead abatement or dispose of lead appropriately in accordance with the *Transportation of Dangerous Goods Act* and by the BC Ministry of Environment Technical Guidance 4[2]. Retaining a third party company specializing in lead abatement may be required to ensure that lead paint is disposed of appropriately. The identified lead residue levels on 'cleaned' structural steel (post-abatement) should not exceed 0.04 mg/ft^2 (~0.0028 mg/m^2).

5. The western tower site exhibited evidence of bird nesting activity. To prevent birds from nesting in the tower, which could potentially complicate the tower decommissioning schedule, attempts should be made to either: a) patch the openings to preclude bird access, or b) remove the wood surrounding the top of the tower, as planned. To avoid undue impacts to potentially nesting birds, do not remove or alter vegetation during the typical sensitive peak breeding period between March 15 and August 15. The current

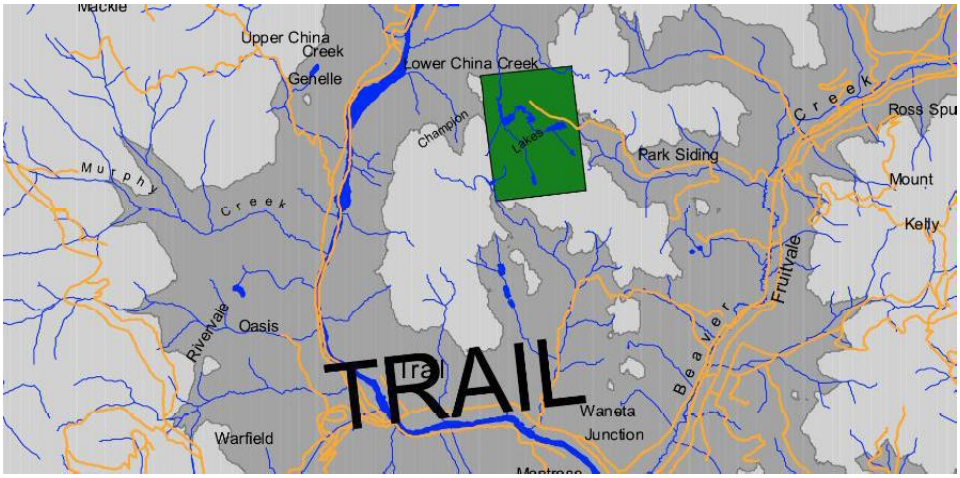
[2] http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/resources/guideline_managing_lead_containing_waste.pdf

(2014) Develop with Care manual denotes an extended passerine nesting window between March 1 – August 31 and the Canadian Wildlife Service (CWS) website should be checked for updates prior to the onset of works. Disturbance or destruction of nesting birds contravenes Section 35 of the *Wildlife Act* and the *Migratory Birds Convention Act*. If land-clearing is necessary within this window, proceed only once a Songbird Nesting Survey is conducted in accordance with CWS protocols to ensure that nesting or breeding wildlife impacts are assessed. If active raptor nests are found, implement buffer zones to reduce sensory disturbance until chicks have fledged.

6. Utilize a qualified biologist to verify that no sensitive species / species-at-risk are present on-site prior to the onset of works, notify appropriate agencies, and monitor accordingly.

7. The Columbia River at the site is situated within the early in-stream work window zone for Rainbow and Cutthroat Trout (July 16 – October 31), as illustrated by the darker grey shading (**Figure 5**). Any in-stream works relating to tower decommissioning (e.g., cable lowering and spooling) should be completed during this period unless there is strong environmental rationale to conduct works outside of the window (e.g., frozen river conditions).

Figure 5: Early In-stream Work Window (July 16 – October 31) for Rainbow Trout and Cutthroat Trout (Dark Grey).



8. Minimize vegetation removal to minimize impacts to the surrounding habitats. If tree and / or shrub removal is required, evaluate options to re-vegetated disturbed areas with native shrub or tree species. Grass seed mix, or other ground cover should be avoided as it can often result in the introduction of non-native species into the area.

9. Western tower concrete footings should be removed via excavator given the good access from the roadway. In contrast, the concrete footings at the eastern tower should be jack hammered and buried on-site as there is no known construction access route on the east side of the Columbia River. Additionally, the eastern tower will likely have to be disassembled and removed / relocated to another staging area via helicopter.

10. Remove food materials / food waste from the site on a daily basis or store in a secure container to reduce the potential for human-wildlife interaction.

11. Conduct environmental monitoring by a Qualified Environmental Professional (QEP) over the duration of works to ensure no harmful impacts to the environment occur and/or can be appropriately mitigated.

12. Ensure that exposed surfaces are protected from erosion and that construction activities do not result in the discharge of sediment-laden water into the Columbia River. If necessary, trenched silt fencing or other appropriate Erosion & Sediment Control (ESC) measures should be installed around the perimeter of the work site to isolate decommissioning activities from the surrounding environment.

11 CLOSURE

We trust this provides the information you currently require. Should you have any questions, please feel free to contact the undersigned.

Respectfully submitted,

AQUATERRA ENVIRONMENTAL LTD.

Digitally signed by Chris Lee
DN: cn=Chris Lee, o=AquaTerra Environmental Ltd., ou=AquaTerra, email=chris@aquaterra.ca, c=CA
Date: 2017.05.08 16:43:31 -07'00'

Chris Lee, M.Sc., R.P. Bio., QEP, BC-CESCL
Principal / Senior Biologist
AquaTerra Environmental Ltd.

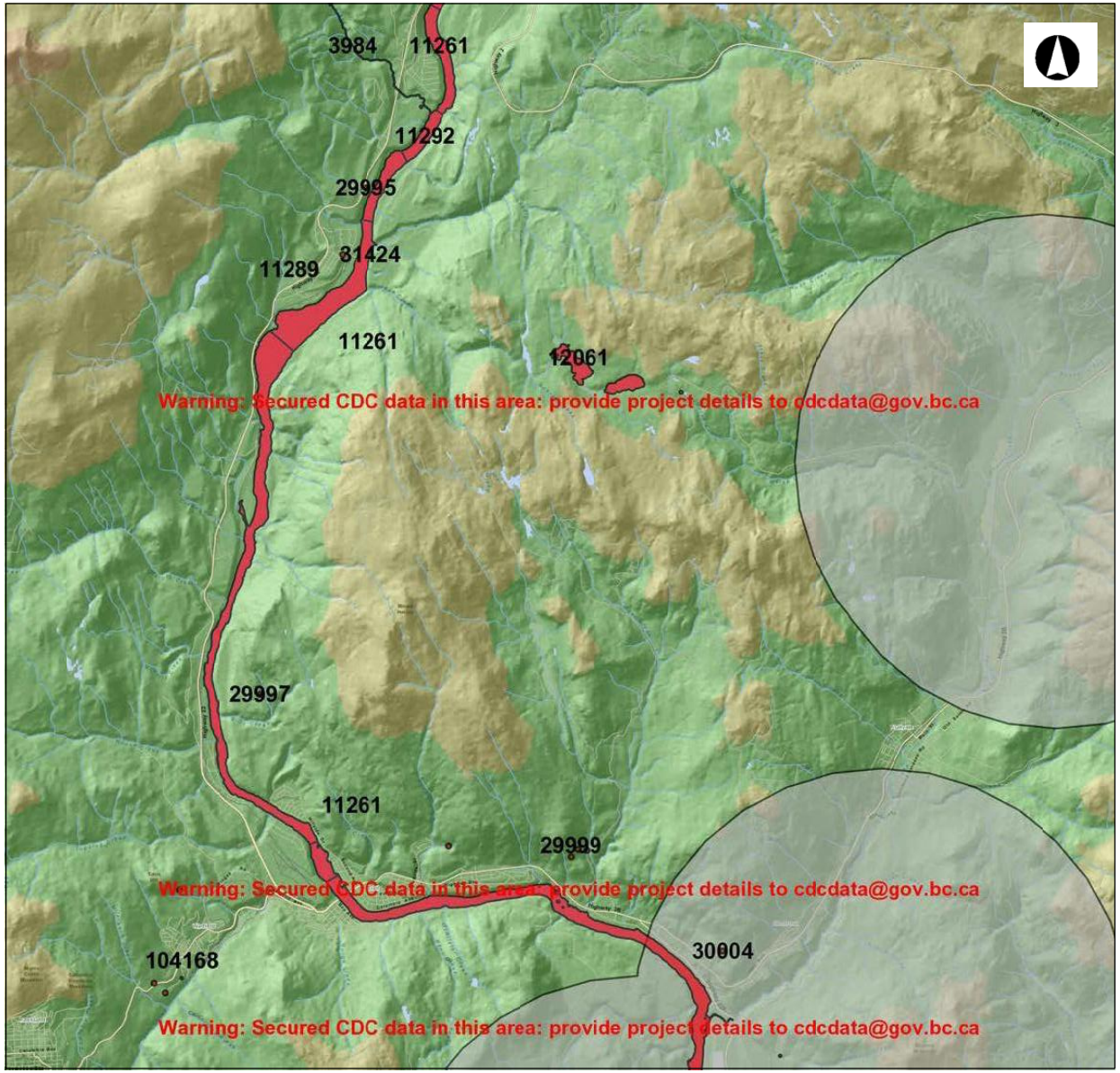
12 REFERENCES

MELP 1999. British Columbia Wildlife Habitat Rating Standards. Prepared by the Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystem Task Force Resources Inventory Committee. Version 2.0. Available on-line here: http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/335486/whrs.pdf

Polster, D. and J. Cullington. 2014. Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia.
Available on-line here:
http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2006/DWC%202006%20Sec%201%20Introduction.pdf

APPENDIX A

BC Conservation Data Centre Results



BRITISH COLUMBIA

CDC Occurrence Map

Legend

Species and Ecosystems at Available Occurrences - CD

FEATURE_CODE

- Animal - Vertebrate
- Animal - Invertebrate
- Plant - Vascular
- Plant - Non-vascular
- Ecological Community

Species and Ecosystems at Secured) Publicly Available

0 2.33 4.66 km

1: 114,556

Copyright/Disclaimer

Datum: NAD83
Projection: NAD_1983_BC_Environment_Albers

Key Map of British Columbia

APPENDIX B

Site Photographs

Photo 1: Birchbank Tower – west side.

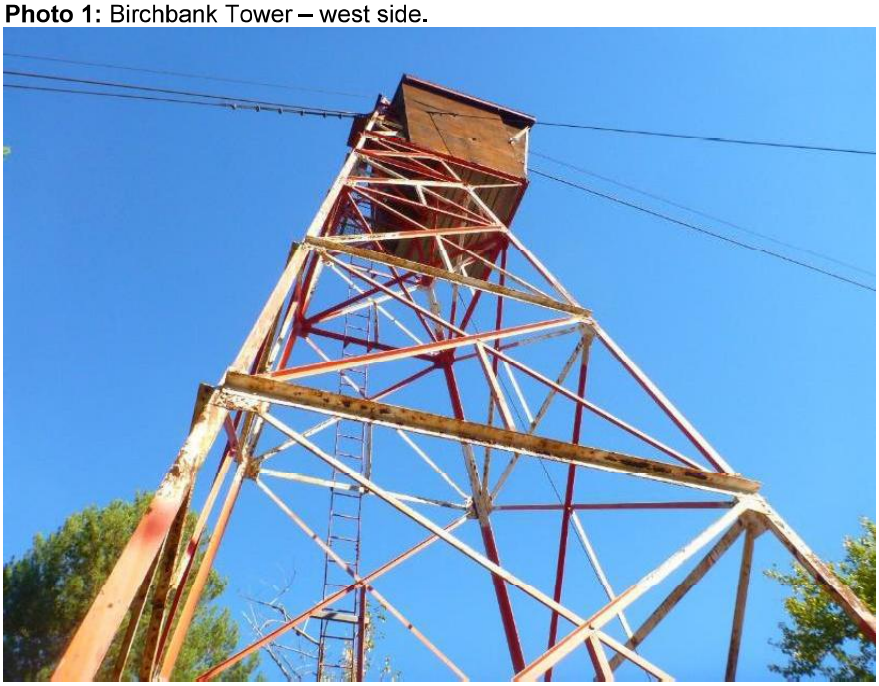


Photo 2: Birchbank Tower – west side – illustrating holes in the wood created by nesting birds.

Photo 3: Typical vegetation assemblage adjacent to the west tower.

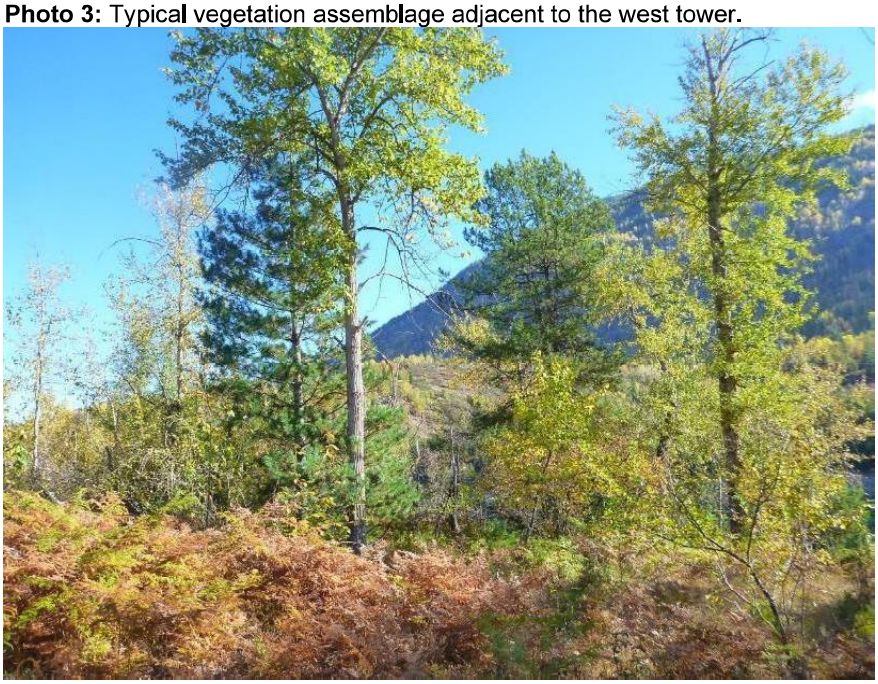


Photo 4: Anchor – west tower.

Photo 5: West tower and ancillary structure (to remain) looking west from the Columbia River.

Photo 6: Columbia River looking east.

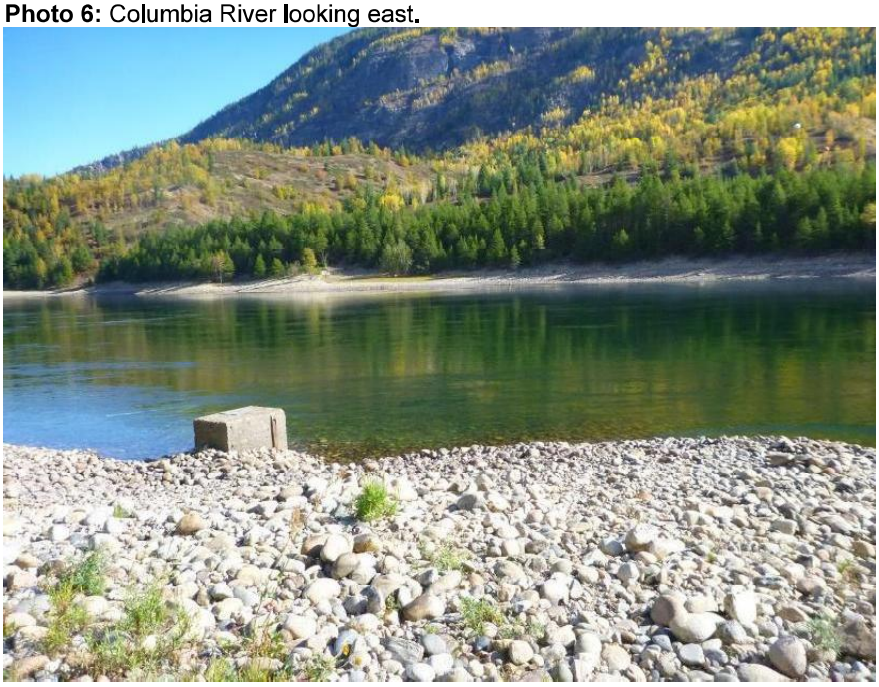


Photo 7: On the Columbia River looing eastward towards the east tower.

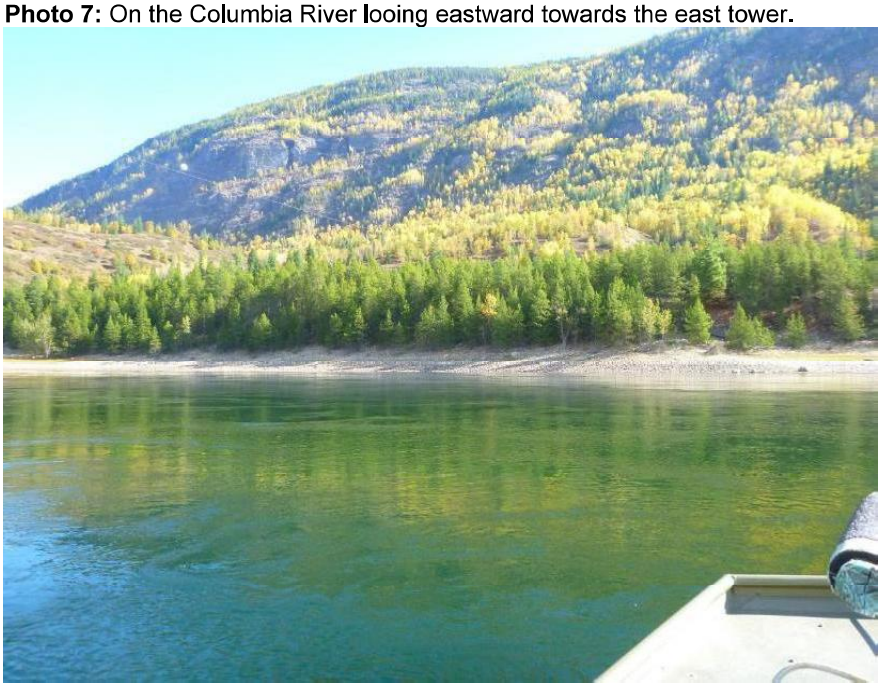


Photo 8: Birchbank Tower - east tower looking east.

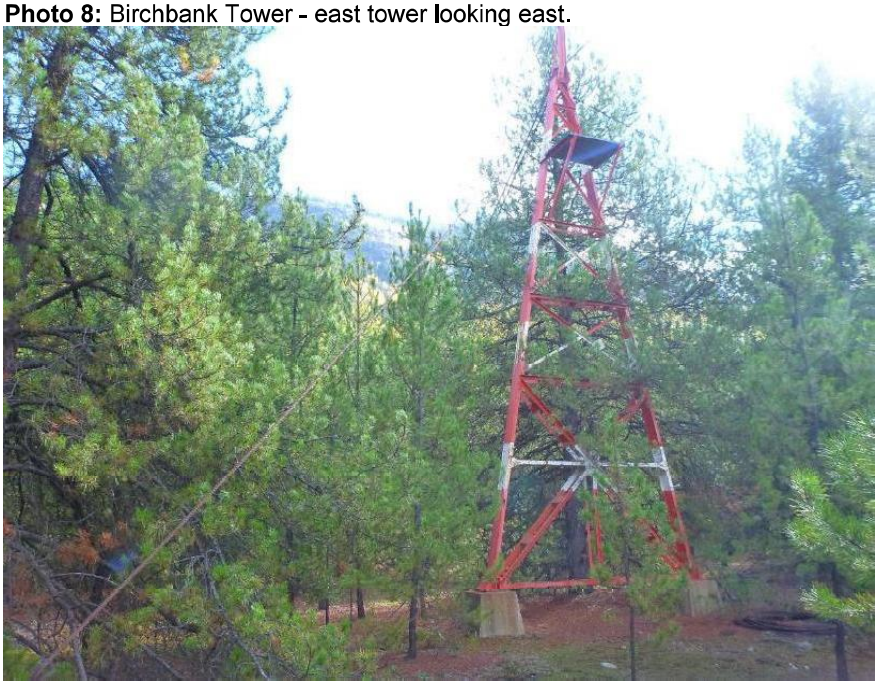
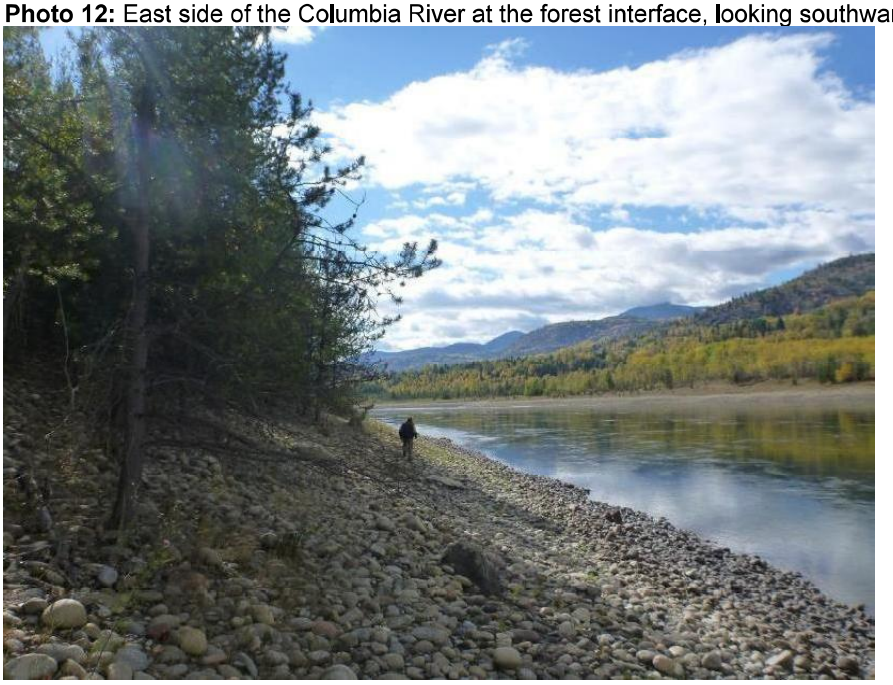


Photo 9: Birchbank Tower – east side – anchor.

Photo 10: East side – elk tracks.

Photo 11: East side – bear scat.

Photo 12: East side of the Columbia River at the forest interface, looking southward.



APPENDIX B

MILLENNIA RESEARCH LIMITED

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Phone: (250) 360-0919 Fax: (250) 360-0975
email: admin@millennia-research.com
http://www.millennia-research.com

ARCHAEOLOGICAL AND HERITAGE CONSULTING

Birchbank Cableway Deconstruction: Archaeological Overview Assessment

Millennia project number: MR1639

Date: December 30, 2016

Prepared for: Public Works and Government Services Canada

Attention: Viera Veidner, Leed AP Senior Environmental Specialist

Version Number: 1

Prepared by: Morley Eldridge, MA, RPCA

Administrative Information

HCA permit: none

First Nations: The Project is in the area of interest of numerous First Nations, as identified by a search of the Consultative Areas Database (CAD):

Secwepemc RFA

Lower Similkameen Indian Band

Penticton Indian Band

Upper Nicola Indian Band

Okanagan Nation Alliance

Okanagan Indian Band

Splats'in First Nation

Osoyoos Indian Band

Shuswap Indian Band

Note than an ATRIS search also identifies a group calling themselves 'Sinixt Nation' from Winlaw, BC. See discussion below.

First Nation notification date: n/a

Field crew n/a

Survey date: n/a

Report disturbed to: PWGSC

Management Summary

Project Overview:

A cable car built in the mid 20th Century to measure water flows in the Columbia River is now obsolete and will be deconstructed. An Archaeological Overview Assessment has assessed the potential for this work to impact archaeological remains.

Results:

HCA Protected Sites: none known in direct conflict.

Archaeological potential is assessed as high on both banks at the tower locations, mainly due to the physiographic location on well-drained terraces adjacent to a major salmon river. No evidence was found for previous archaeological assessment of the work areas.

Management Recommendations:

Archaeological monitoring of the excavation portions of deconstruction of both towers. This will require a permit issued under Section 14 of the BC *Heritage Conservation Act*.

Introduction

Public Works and Government Services Canada asked Millennia Research Limited to undertake an overview assessment of this cable crossing deconstruction.

Study Area and Project Description

A cable car crosses the Columbia River at Birchbank, a few kilometres upstream from Trail. The cable car was constructed in the mid 20th century, prior to any regulation that would have required an Archaeological Impact Assessment (AIA). The cable car was used to measure water volumes but is now obsolete and in poor repair. The cable car will be deconstructed which will require heavy equipment to remove large concrete footings and anchors.

Existing Data Review

The Study Area was subject to a desk-based review of available ethnographic, archaeological and map-based sources. These sources were reviewed in order to clarify the archaeological potential of the project area, with reference to the specific development where possible. The sources examined and general findings are outlined below:

- Map-based data sources:
  - Google Earth
  - TRIM Contours, Streams, etc.

- Archaeological predictive model:

A model was present on RAAD November 9 but absent December 29, 2016. It showed the cable car crossing to be in moderate potential.

- Previously recorded sites in Provincial Heritage Register:

RAAD accessed: November 9, 2016; December 29, 2016.

Table 1. Previously recorded sites in vicinity of Project (north to south).

Site #	Project Area (Y/N)	Location/ Proximity to Project	Site Type	Reference
DhQk-4	N	2700 m NNE	Cache Pits, Lithic	Baker (1983)
DhQk-7	N	1160 m NNW	Lithics	Lackowicz (2000)

DhQk-2	N	720 m N	Housepit?	Baker (1983)
DhQk-9	N	430 m SW	Lithics	Nicholls (2012)
DgQk-4	N	2590 m SSW	Housepit? Cache pit?	Baker (1983)

- Other archaeological studies:
  - Provincial Archaeological Report Library (PARL) keyword search: (November 9 & December 29, 2016.)
    Keywords: Birchbank
    Reports associated with sites in RAAD were retrieved from PARL. These were searched for information about the area's archaeological study, potential, and any references to other studies that may have been completed in the study area without finding archaeological remains.

Relatively little archaeological work has been conducted in this part of the Columbia River valley, and relatively few sites are known (Table 1). In the early 1970s, the Department of Highways conducted a wide-ranging non-intensive archaeological inventory that recorded sites both north and south of the present study area (Robinson and Pierre 1973). A decade later, the author conducted a brief survey in the general area in 1981 (various siteforms).

Substantive work did not occur until the impact to archaeological sites from proposed construction of a BC Hydro dam at Murphy Creek, between Castlegar and Trail, was evaluated in the early 1980s. Baker conducted a non-permit (but with subsurface testing) inventory of the affected area in 1980, and returned to conduct evaluative testing under permit in 1982 (Baker 1983).

Three sites in the vicinity of the cable car (Table 1) were recorded by Baker. DhQk-2 (Figure 1, Figure 2) was recorded on the basis of cultural depressions, the siteform noting one as rectangular, 2 x 4 m size and 1.5 m deep, a possible miner's cabin, and a round feature as 3 x 3 m circular by 1 m deep interpreted as a possible precontact housepit. Extensive testing (five 1x1 m units and 14 50x50 cm units) revealed no cultural materials. "One possible flake was initially recorded...subsequent analysis has determined it to be natural not cultural" (Baker 1983:5-8). It appears likely that the 'site' has no precontact aboriginal material, although the testing (to 60 cm) may not have been deep enough to rule out this possibility. The lack of description of historical materials suggests that the features are not historic either. A 2003 update of comments in this siteform by Archaeology Branch staff did not include the doubtful nature of this site (the flake was still assumed to be cultural without reference to the report re-evaluation as natural).

Figure 1. Archaeological sites in the general area of the cable car crossing (red line).

Figure 2. Archaeological sites in vicinity of cable car crossing (red line across river).

DhQk-4 was also recorded as a cultural depression site, with six smaller features all interpreted as cache pits. Six 50 x 50 cm units and two 4 x 1 m trenches through depressions were excavated. A single obsidian flake was recovered from one of the trenches.

DgQk-4 is only mentioned once in the report (Baker 1983:10-1) with a suggestion that the location could hypothetically contain palaeontological material. The site forms describe two depressions

that although similar in size to aboriginal features, may have been caused by a train derailment known to have occurred here. One of the depressions contained "cultural material" in the form of a buried whiteish-grey substance, thought to be agricultural fertilizer (siteform). It appears that this site too may contain no pre-contact cultural materials.

Two AIAs in the decades since the Baker study have found archaeological material reasonably close to the cable car. A transmission line survey generally paralleling the Columbia from Brilliant to Warfield found a lithic scatter on a terrace remnant just over a kilometre upstream from the cable car (Lackowicz 2000). Just 400 m south of the cable car, an AIA of habitat enhancement found a small lithic scatter (Nicholls 2012).

In summary, two of the archaeological sites recorded near the project area may not be archaeological at all; and the other sites have limited archaeological materials and features. Many more sites, however, are recorded at somewhat greater distances.

No other archaeological work, especially with negative findings, was found in PARL searches and reviews of the bibliographies in reports associated with site forms.

Ethnography

This region forms part of the Plateau Culture Area (Ray 1939), a physiographic/ethnic region that lies between the Continental Divide and the Cascade and Coast Mountain ranges of the NW US and British Columbia. Most of the Plateau Culture Area spoke relatively closely-related Salishan languages. The Columbia River at the study area was the home of the Sinixt (or Sinaikst or Lakes) people, who spoke a dialect of the Okanagan-Colville language (Kennedy and Bouchard 1998), while the Ktunaxa speak a language with no known relationship to any other language (Brunton 1998). Although Brunton's map shows the Kootenai (or Ktunaxa) territory at 1792 as not falling as far downstream on the Kootenay River as the Columbia, although Brolly (1994) states that Ktunaxa people used the Columbia through the Arrow Lakes through the historic period. Various descendent groups of these original language speakers now have statements of intent that include this area (as listed above).

The population of Sinaikst is thought to have fallen precipitously. mainly from disease, to about 200 by contact, and continued to fall through the historic period (Brolly 1994). The last Sinaikst (Alex Christian) left his home at the confluence of the Kootenay and Columbia river in 1919 and moved downstream to live with relatives at Kettle Falls (Walton and Wilkinson 2009). Other members had by this time had joined neighbouring groups, including various communities in Secwepemc, Ktunaxa, Okanagan, and Nlaka'pamux, as well as part of diaspora of urban aboriginals living across North America. The Canadian Government declared the Sinaikst extinct in 1953, when the last registered member of the "Arrow Lakes Band" died. According to the "community" information on ATRIS, a group from Winlaw, Slocan Valley, BC has asserted that they represent 75 Sinixt descendant members. The ATRIS summary says the Sinixt Nation is not "a band registered under the Indian Act, nor a Treaty First Nation, and it has no reserve lands or other official land base". The Sinixt have entered a writ of summons to assert title over an area centred on the Columbia from the Canada/US border north to Revelstoke, including the Slocan Valley. The right of the 'Sinixt Nation' to represent descendants of the Sinixt is apparently controversial, with Okanogan Nation Alliance and Colville Confederated Tribes both denying this (Campbell, et al. 2012).

The Sinixt lived in villages of semi-subterranean houses during the winter, and in mat lodges during the summer, when smaller family groups dispersed to extract resources over a wide area. Fishing for salmon, sturgeon, and other species was paramount, conducted with traps, weirs, and nets. The surplus was dried for later consumption, often stored in underground pit caches. Large drives for ungulates were also conducted. Roots and berries were harvested and processed in the uplands. Travel was mostly by canoe, with horses becoming increasingly important in the historic period (Kennedy and Bouchard 1998).

Potential Assessment and Expected Site Types

The cable car footings appear to be on related (same elevation and presumed same age) terraces of the Columbia River (Figure 3 through Figure 5). This physiographic setting in an of itself would indicate high archeological potential, given that the Columbia was, prior to hydroelectric dams, a major fish-bearing river and a transport corridor. Terrace landforms provide stable, level well-drained areas in which to live. The left bank appears basically undeveloped apart from the tower itself. The right bank is more heavily developed with other structures in the vicinity.

Expected site types for the area include housepits, cachepits, and lithic scatters. Human burials are possible though appear to be uncommon in the area generally. All these are most likely to be found on a terrace edge near the river. Trails also tended to follow terrace edges, although evidence sufficient to identify an archaeological trail are unlikely to be found here. However, lost or abandoned artifacts along trails will form a band of higher artifact density compared to random areas of the landscape. Pictographs are present in the region but not expected at the study area (unless there are large boulders in the vicinity). The overall density of cultural material in this part of the Columbia valley appears lower than for comparable areas of the Fraser Canyon or Thompson River, but this may also reflect lower amounts of archaeological research in this area compared to the previous examples.

Figure 3. Birchbank cable car location looking north, Google Earth image.

Figure 4. "Far Side" or left bank tower location on terrace.

Figure 5. "Home side" or right bank of the Columbia, showing apparent terrace location.

Recommendations

Recommendations summary (details below):

☒ Section 14 AIA

☐ Section 12 Site Alteration permit

☐ Due diligence procedures only

The potential for impact with archaeological materials is not as high as it would be for new construction with a similar scope. The footings and anchors will need to be dug out, but the construction footings would have been excavated originally, so much of the modern excavation will be in previously disturbed ground. Some new excavation is to be expected, however. Even in previously disturbed areas there is potential for human remains, artifacts, and other archaeological materials to be uncovered. The locations of both towers have high archaeological potential and the risk of encountering previously unrecorded archaeological remains is considerable.

Recommendations include:

- monitoring by an archaeologist during the excavation phase of the project, since it is concluded that there is a substantive risk of encountering archaeological remains (but most likely, any such finds will have been disturbed previously);
- An ***HCA* permit will be required.** The application should be worded to include monitoring only with the option to conduct mitigative work should archaeological material be encountered. This should eliminate the necessity of completing an AIA prior to the work**;**
- A contingency for emergency impact mitigation (data collection, analysis and reporting) should be included in the monitoring contract.

Disclosure Statement & Signature

The current study is concerned with the management of archaeological sites which may be affected by development. Unidentified cultural deposits may be present within the project area. On provincial land these deposits may be protected under the *Heritage Conservation Act*. If unanticipated archaeological remains (including but not limited to those identified as potential site types in this document) are encountered during construction or land-altering activity the developer is advised to halt work in the immediate area and contact a professional archaeologist and the appropriate regulatory agency.

The information contained in this report has been compiled specifically for the project as defined by the proponent and discussed herein. Any subsequent changes to the proposed project may not be addressed by the current archaeological study and additional studies may be appropriate.

The information compiled in this report has been prepared in accordance with the standards of the BC Association of Professional Archaeologists and the BC Archaeological Impact Assessment Guidelines (British Columbia Archaeology Branch 1998).

References

Baker, James

1983 *Murphy Creek Project. Heritage Resource detailed impact assessment. 1982-0020.* Okanagan College for BC Hydro.

British Columbia Archaeology Branch

1998 B.C. Archaeological Impact Assessment Guidelines, edited by Archaeology Branch. Third ed. Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Brolly, R

1994 *Brilliant Interchange project archaeological impact assessment. 1994-055*. Arcas Consulting Archaeologists Ltd. for Archaeology Branch.

Brunton, BIll B.

1998 Kootenai. In *Plateau*, edited by D. E. Walker, Jr., pp. 223-237. Handbook of North American Indians. vol. 12, W. C. Sturtevant, general editor. Smithsonian Institution, Washington.

Campbell, Bob, Robert Watt and Marilyn James

2012 A message from Sinixt Nation representatives in Canada, http://sinixtnation.org/content/message-sinixt-nation-representatives-canada.

Kennedy, Dorothy and Randall T. Bouchard

1998 Northern Okanagan, Lakes and Colville. In *Plateau*, edited by D. E. Walker, Jr., pp. 238-252. Handbook of North American Indians. vol. 12, W. C. Sturtevant, general editor. Smithsonian Institution, Washington.

Lackowicz, Rob

2000 *Archaeological impact assessment results for West Kootenay Power Ltd.s proposed 230 kV transmission system development near Castlegar, BC. 2000-270*. Kutenai West Heritage Consulting for West Kootenay Power.

Nicholls, Nicole

2012 *Archaeological impact assessment of Teck Metals Ltd.'s proposed upgrades to the Birchbank Syne Habitat Enhancememt Project 700 m long access road and alternate access road, located 200 m west of the Columbia River, 20 km south of Castlegar. 2012-0071*. Golder Associates Ltd for Teck Metals Ltd.

Ray, V.F.

1939 *Cultural Relations in the Plateau of Northwestern America*. The Southwest 3. Frederick Webb Hodge Anniversary Publication Fund, Los Angeles, CA.

Robinson, Mike and Paul St. Pierre

1973 *Dept. of Highways Archaeological Survey Final Report, Summer 1973*. Report on file at the Archaeology and Registry Services Branch.

Walton, Muriel and Myler Wilkinson

2009 Closing of the Circle: Descendants of Alex Christian—the White Grizzly. http://sinixtnation.org/files/Closing-of-the-Circle-2009_1%20white%20grizzly.pdfhttp://sinixtnation.org/files/Closing-of-the-Circle-2009_1%20white%20grizzly.pdf.

May 9, 2017 ***Technical Memorandum***

Birchbank Cableway Deconstruction and Site Rehabilitation Specifications: Archaeological Component

References

.1 Eldridge, M. 2017. *Birchbank Cableway Deconstruction: An Archaeological Overview Assessment*. Millennia Research for PWGSC, non-permitted report.

Definitions

.1 **Archaeological resource**: a human work, an object or a place that is directly associated with an aspect or aspects of human history or material culture.

.2 **Archaeological site**: places which have detectable archaeological evidence of past human activity. Site types may include burial mounds and cairns, surface lithic scatters, hearth features, cultural depressions, roasting pit features, and culturally modified trees (CMTs).

.3 **Historic era site**: any structure, site or object associated with past colonial-related activity in North America. Historic sites more than 40 years old from present may be protected on Federal Lands in Canada.

.4 **Traditional use site**: any geographically-defined site (on land or water) used traditionally by one or more groups of First Nations people for some type of activity. These sites may lack the physical evidence of human-made artifacts or structures, yet maintain cultural, spiritual or other significance to a living community of people.

General

.1 At the discretion of the Departmental Representative in consultation with a professional archaeologist, the Contractor shall coordinate with and permit the Archaeological Monitor time required to assess all excavated material.

.2 During preparation of work sites, above-ground cableway deconstruction and any other activities not requiring the presence of the Archaeological Monitor, artifacts, relics, antiquities and items of historical or scientific interest such as cornerstones, commemorative plaques, inscribed tablets and any objects found on the work site that may be considered part of an archaeological site shall be reported to the Departmental Representative immediately. The Contractor and workers shall wait for instruction before proceeding with their work. In instances of work with no potential to impact sub-surface soils and sediments and in the absence of the Archaeological Monitor, provide documentation to include photographs of what was seen, the location of where the material was encountered, what the surrounding soil looked like, how deep it was from the ground surface, or if it was at ground surface.

.3 All archaeological or historical objects found are protected under Federal or Provincial Acts and regulations. The Contractor and workers shall stop work, protect any artifacts in place and request direction from the Departmental Representative.

.4 Archaeological resource issues to be a component of daily tailgate meetings.

Archaeological Monitor

.1 Archaeological monitoring will be performed by a professional archaeologist.

.2 An Archaeological Monitor must be present during any activities with the potential to impact sub-surface soils and sediments, disturbed or intact, and to record and collect any observed cultural material.

Archaeological Resource Sites

.1 In areas of particular archaeological concern, the method of excavation (bucket size and type) shall be determined with input from the Archaeological Monitor. All machine excavation in areas with potential for archaeological deposits will be conducted with a smooth edged/finishing bucket if directed by the Archaeological Monitor.

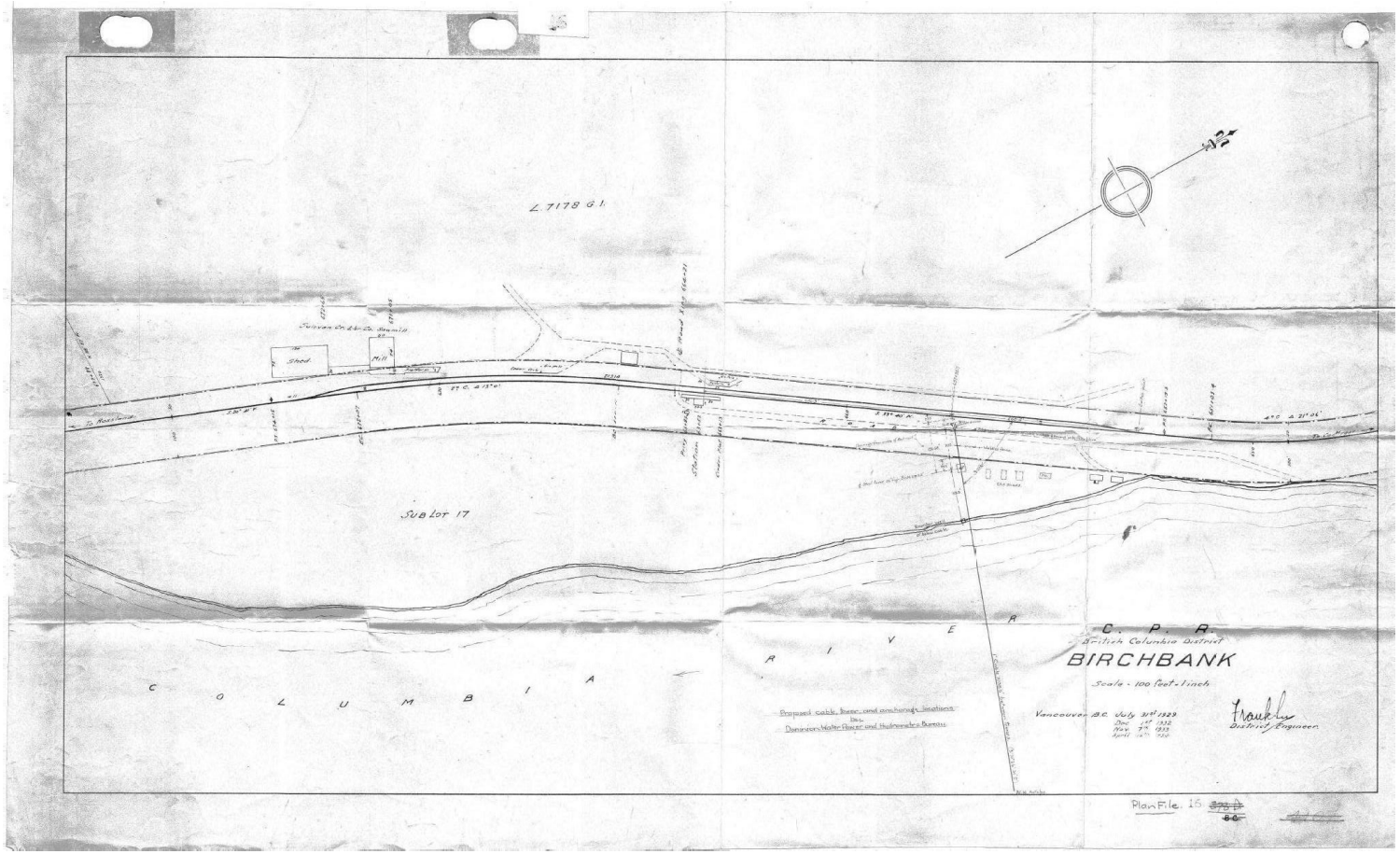
.2 Work in deconstruction work sites shall proceed under the direction of the Departmental Representative and the Archaeological Monitor. In areas where archaeological resources are identified as work proceeds, subsequent work may include incremental machine excavation in combination with recovery of material culture objects such as artifacts, faunal remains, and other potential diagnostic objects using archaeological methods.

.3 Where archaeological features, such as hearths or house depressions, are encountered during monitoring, machine excavation may be paused or directed to an alternate location while the feature is documented and an appropriate sample is hand excavated prior to resuming machine excavation.

.4 All soils or sediments that may be archaeological in origin shall stay within the defined archaeological resource site. Material shall be spread within the site to the satisfaction of the Departmental Representative.

APPENDIX C

The existing drawings included in this Appendix C are for information only. There is no guarantee that the information shown on those drawings are a true representative of the existing structure condition.

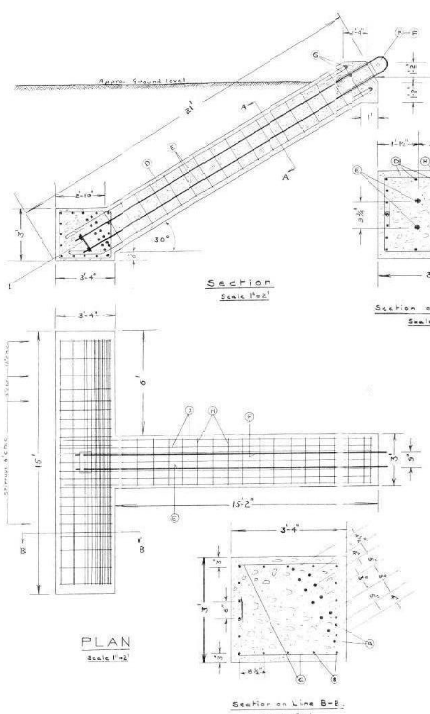

L 7178 G.I.
Sullivan Co. & Lo. Sawmill
The Shed
Mill
To Revelstoke
SUB LOT 17
C O L U M B I A
R I V E R
C. P. R.
British Columbia District
BIRCHBANK
Scale - 100 Feet - 1 inch
Proposed cable, buoy, and anchorage locations
Dominion Water Power and Hydrometric Bureau
Vancouver B.C. July 31st 1929
Dec 1st 1932
May 7th 1933
April 16th 1934
District Engineer
Plan File. 15

Plan Nº 7.

Note: Backfill Trench over Beam and Stem with 1:4:8 Concrete on Submerged side.

Use 1:2:4 Concrete for Anchorage (10.4 Cu. Yds.)

All Reinforcement Mild steel Round Rods, Hooked at ends 8" except Ⓔ Ⓕ and Ⓖ

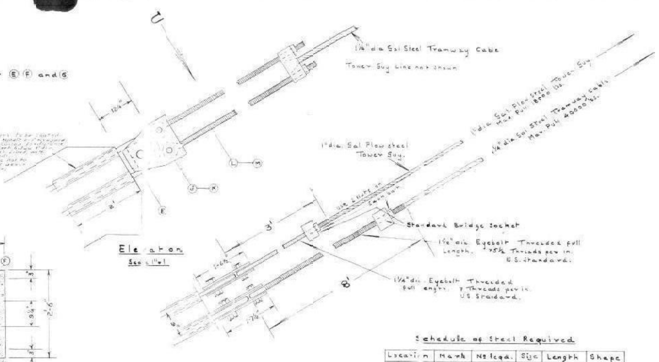


Section
Scale 1"=2'

Section on Line A-A
Scale 1"=1'

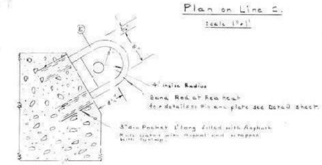
PLAN
Scale 1"=2'

Section on Line B-B.
Scale 1"=1'

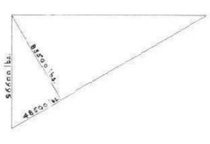


Elevation
Scale 1"=1'

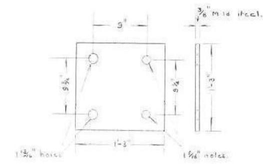
Plan on Line C.
Scale 1"=1'



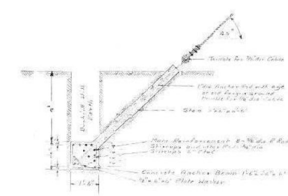
Elevation
Scale 1"=8"



Force Diagram for Anchorage



Details of Anchor Plate Ⓘ.



Use this Anchorage for Tower Side-Guys (2).
Note: No Side-Guys on A-Frame.

Schedule of Steel Required

Location	Mark	Nº reqd.	Size	Length	Shape
Beam	Ⓐ	12	¾" dia.	17'-0"	
do.	Ⓑ	18	⅝" dia.	17'-0"	
do.	Ⓒ	23	½" dia.	13'-0"	
Stem	Ⓓ	24	½" dia.	22'-0"	
do.	Ⓔ	1	1⅜" dia.	20'-8"	
do.	Ⓕ	1	1⅛" dia.	20'-8"	
do.	Ⓖ	2	½" dia.	3'-3"	
do.	Ⓗ	17	½" dia.	3'-0"	
Beam	Ⓘ	1	¾" T.	1'-3" x 1'-3"	
—	Ⓙ	2	½" T.	-7½"	
—	Ⓚ	2	5/16" T.	-6½"	
—	Ⓛ	2	1⅛" dia.	8'-0"	
—	Ⓜ	2	1¼" dia.	3'-0"	
—	Ⓝ	1	—	1¾" x 8" x 9"	
—	Ⓟ	1	—	1¼ x 7" x 8"	

Total weight of Concrete Anchorage 41960 lbs.
" " " Earth Backfill over Anchorage 36960 lbs.
" " " ½ of Earth Prism 17680 lbs.

Weight to resist movement of Anchorage

(1) Concrete Anchorage 41960 lbs.
(2) Earth Backfill 36960 lbs.
(3) ½ of Earth Prism 17680 lbs.
96600 lbs.

Coeff. of friction ·50

Force Required to move Anchorage

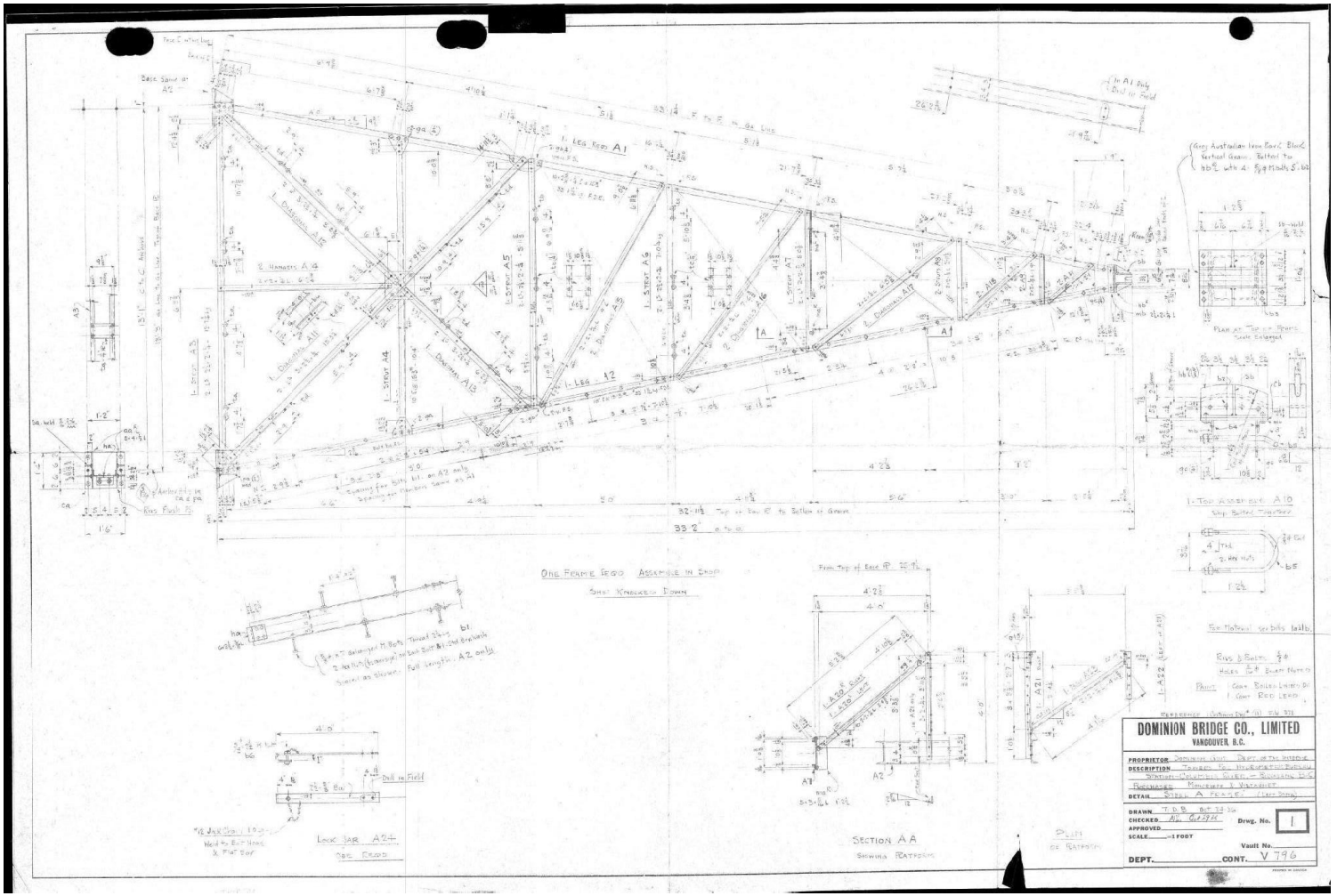
$$\frac{83500}{2} + 48500 = 90250 \text{ lbs.}$$

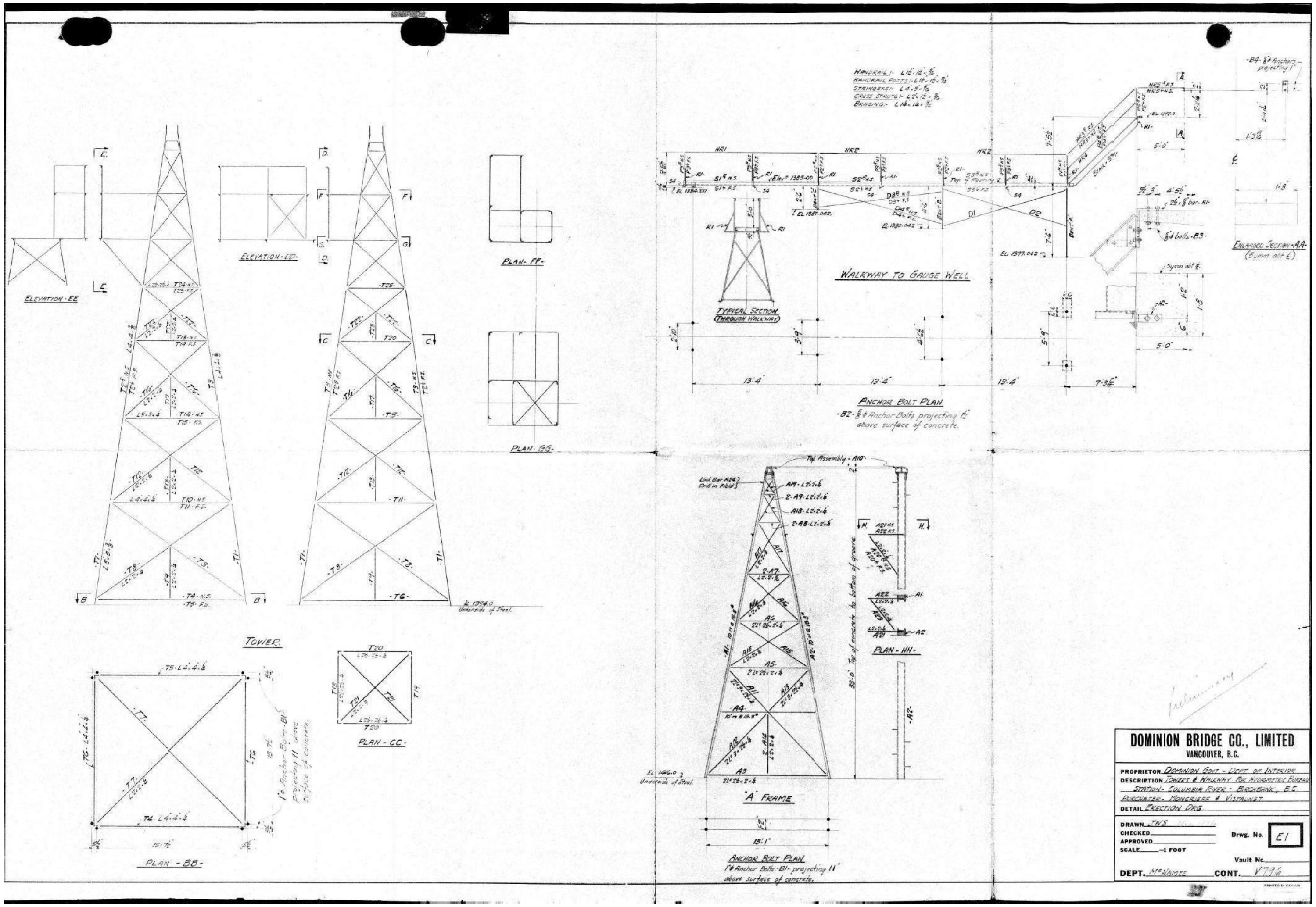
Max pull on Anchorage 40000 lbs.

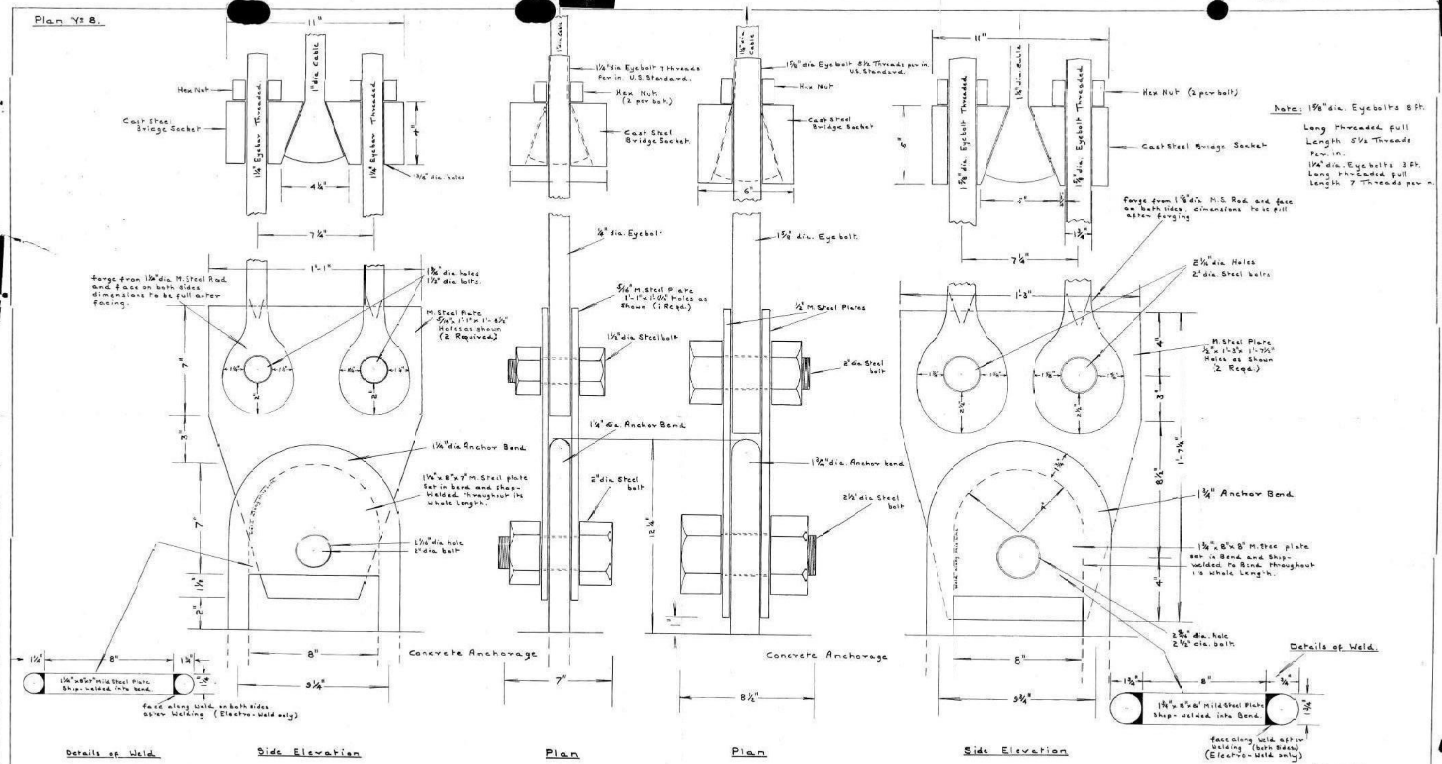
$$\text{factor of Safety} = \frac{90250}{40000} = 2.25.$$

Dominion Water Power and Hydrometric Bureau
Office of Dist. Chief Eng. Vancr. B.C.

Drawn by E.H.T. Approved. Aug. 1934.	Details of Anchorage Proposed Cable – Crossing Columbia River B rchbank B.C.	Plan File Nº 378 Report File Nº 400 Corres. File Nº 1248

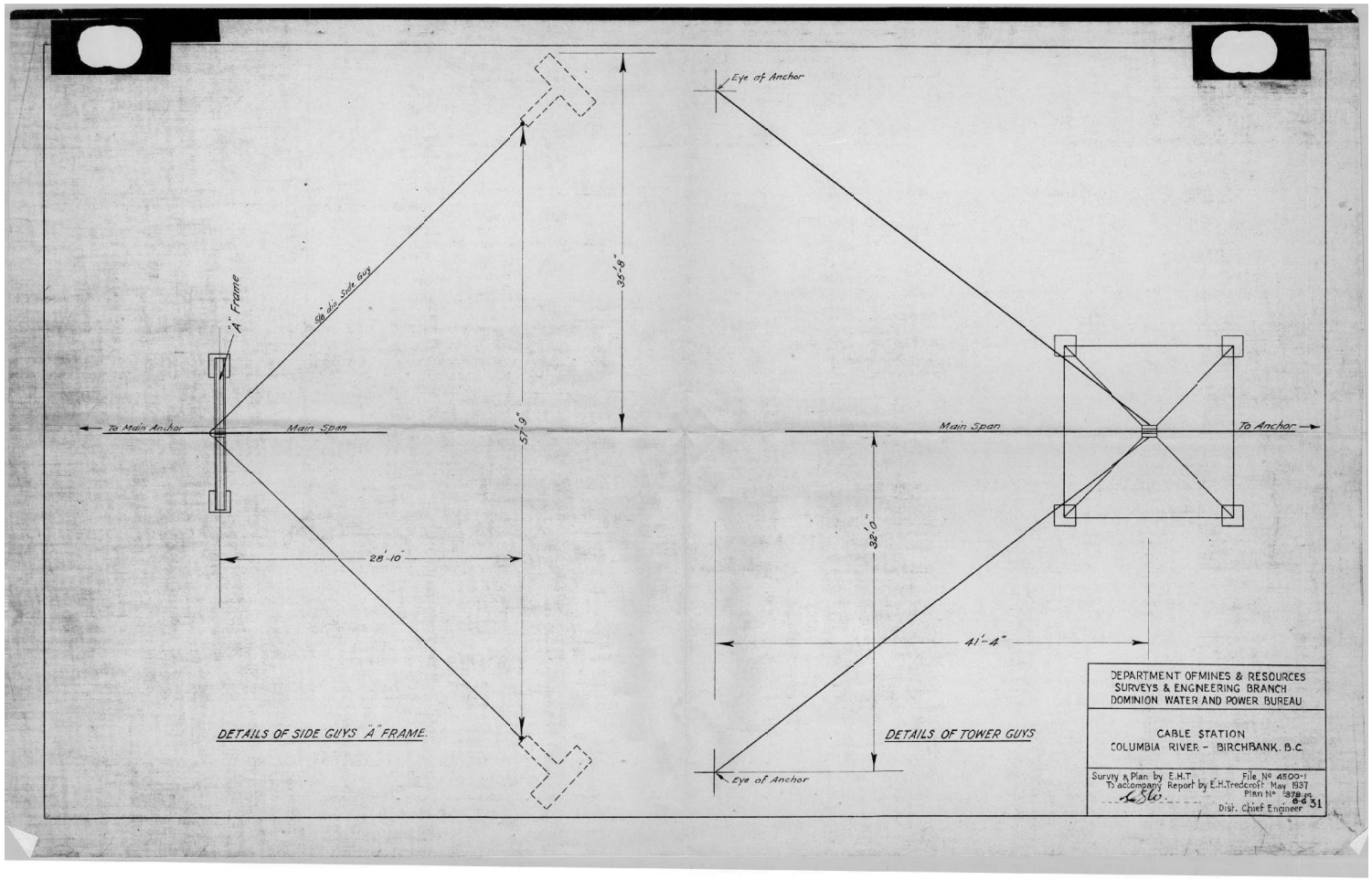

ONE FEMPE REGD ASSEMBLE IN SHOP
SHIP KNOCKED DOWN
SECTION A A
SHOWING PLATFORM
LOCK JAR A24
DOM ROOD
DOMINION BRIDGE CO., LIMITED
VANCOUVER, B.C.
PROPRIETOR
DESCRIPTION
DRAWN
CHECKED
APPROVED
SCALE
DEPT.
CONT. V 796
Drwg. No. 1
Vault No.


ELEVATION - EE
ELEVATION - DD
PLAN - FF -
PLAN - GG -
TOWER
PLAN - BB -
PLAN - CC -
WALKWAY TO GAUGE WELL
TYPICAL SECTION (THROUGH WALKWAY)
ANCHOR BOLT PLAN
ENLARGED SECTION - AA - (Symm. abt ℄)
'A' FRAME
PLAN - HH -
DOMINION BRIDGE CO., LIMITED
VANCOUVER, B.C.
PROPRIETOR DOMINION GOVT - DEPT OF INTERIOR
DESCRIPTION TOWERS & WALKWAY FOR HYDROMETRIC BUREAU STATION - COLUMBIA RIVER - BIRCHBANK, B.C.
PURCHASER - MONCRIEFF & VISTAUNET
DETAIL ERECTION DRG.
DRAWN JWS
CHECKED
APPROVED
SCALE —1 FOOT
Drwg. No. E1
Vault No.
DEPT. McNAMEE
CONT. V796
PRINTED IN CANADA



Dominion Water Power and Hydrometric Bureau
Office of the Chief Eng. Vancr. B.C.

Drawn by E.H.T.	Details of Anchorage revised	Plan file No 378
Approved	Cable - Crossing	Report file No 400
Aug 1936	Columbia River	Corres file No 3248
	Birchbank B.C.	



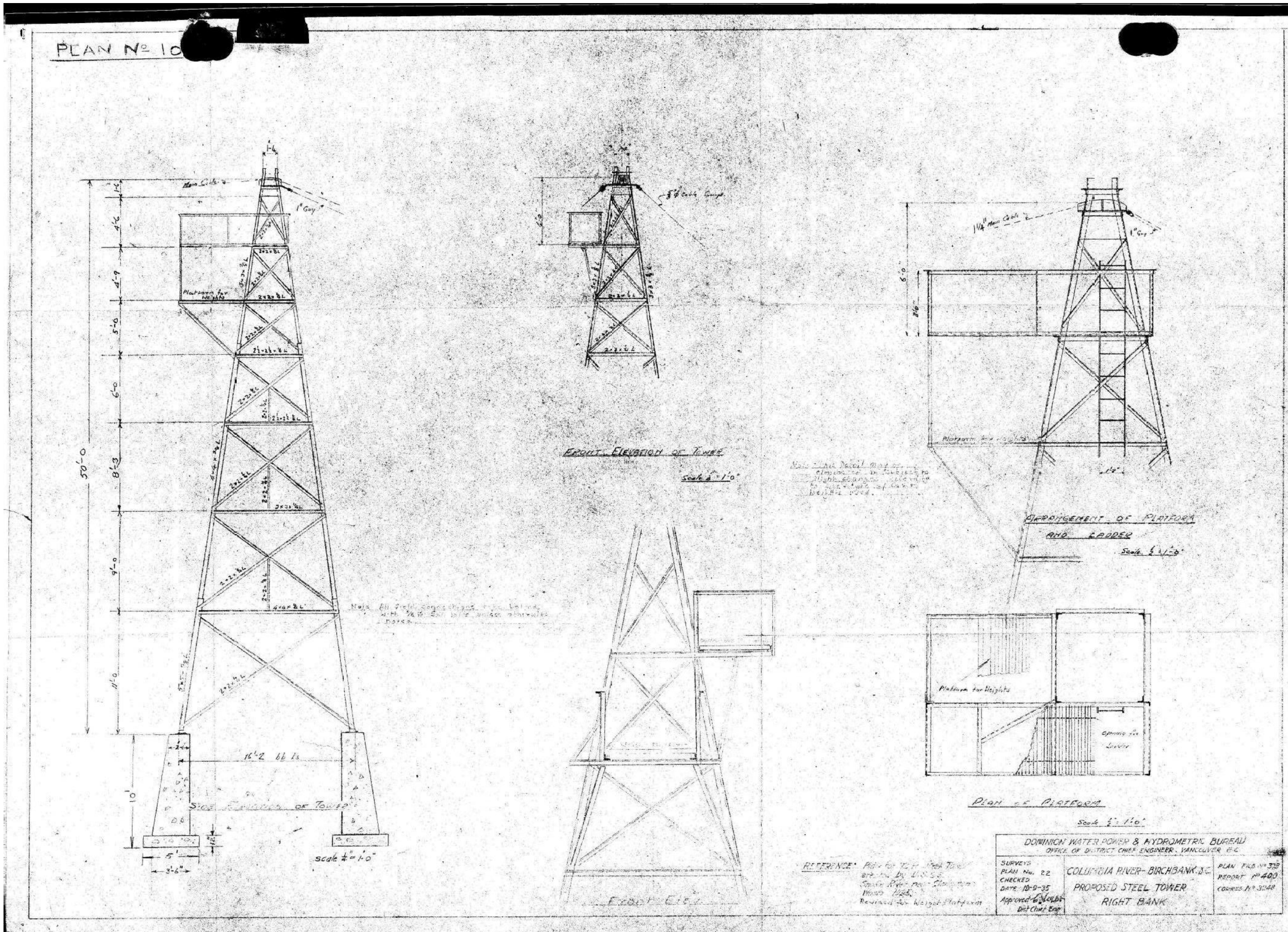
DETAILS OF SIDE GUYS "A" FRAME.

DETAILS OF TOWER GUYS

DEPARTMENT OF MINES & RESOURCES
SURVEYS & ENGINEERING BRANCH
DOMINION WATER AND POWER BUREAU

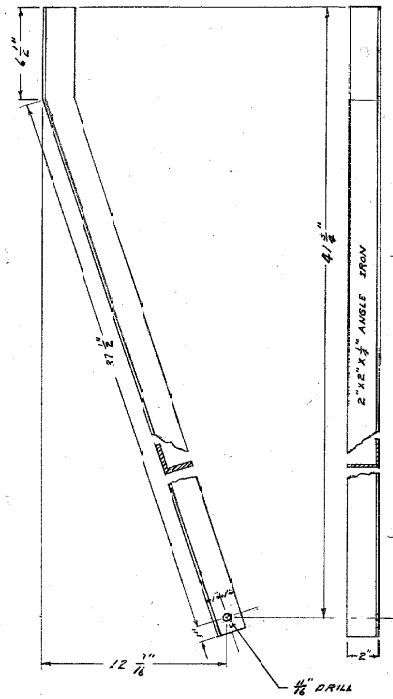
CABLE STATION
COLUMBIA RIVER - BIRCHBANK, B.C.

Survey & Plan by E.H.T. File No 4500-1
To accompany Report by E.H. Tredcroft May 1937
Plan No 378-m
84 31
Dist. Chief Engineer



PLAN No 1
Front Elevation of Tower
Scale 1/8" = 1'-0"
Arrangement of Platform and Ladder
Plan of Platform
Scale 1/2" = 1'-0"
Side Elevation of Tower
scale 1/4" = 1'-0"
Front Elev.
50'-0
10'
5'
3'-6"
REFERENCE: Revised for Weight Platform
DOMINION WATER POWER & HYDROMETRIC BUREAU
OFFICE OF DISTRICT CHIEF ENGINEER. VANCOUVER B.C
SURVEYS
PLAN No. 22
CHECKED
DATE 19-9-35
Approved
Dist Chief Eng
COLUMBIA RIVER - BIRCHBANK, B.C.
PROPOSED STEEL TOWER
RIGHT BANK
REPORT No 400
CORRES. No 3248

SKETCH #12

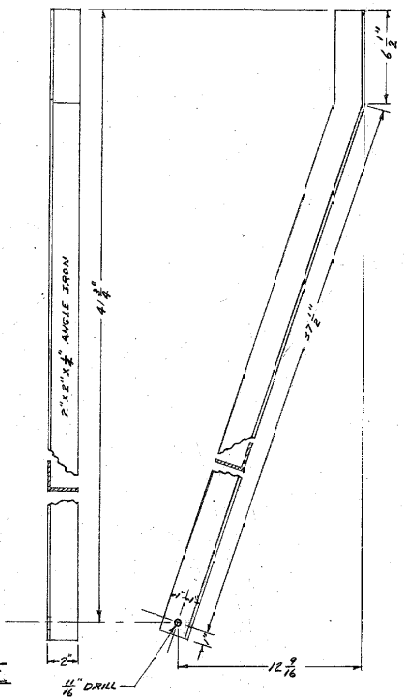


PAINT WITH RUST RESISTING PAINT AFTER FABRICATION.

RIGHT HAND BRACE
SCALE: 1/6 FULL SIZE.
MATERIAL :- 2"X2"X1/4" ANGLE IRON.
1 REQUIRED

FOR LEFT BANK A-FRAME
COLUMBIA RIVER AT BIRCHBANK.

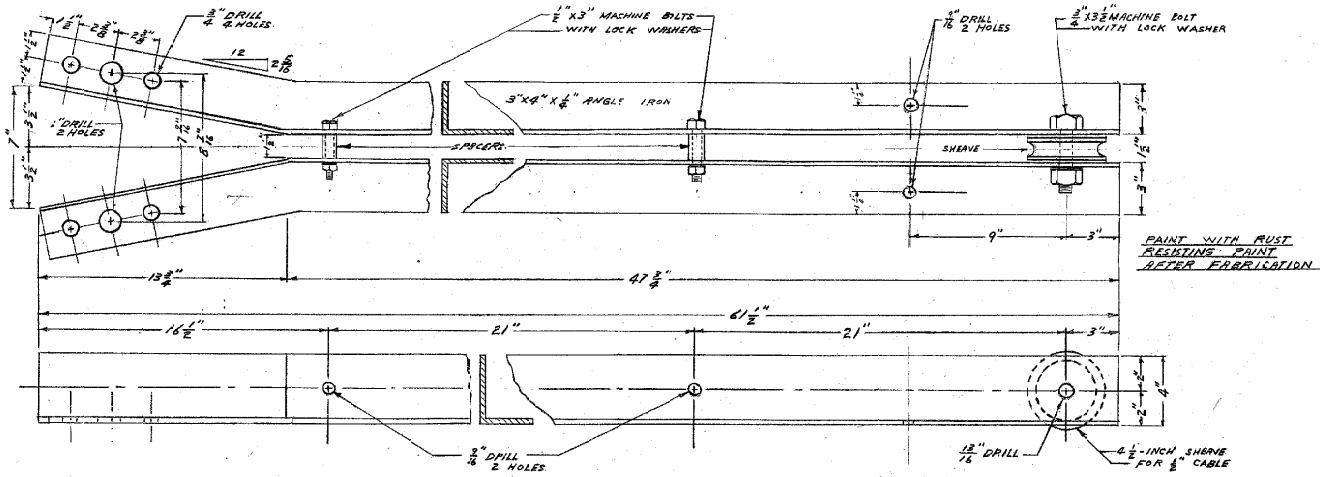
PAINT WITH RUST RESISTING PAINT AFTER FABRICATION



LEFT HAND BRACE
SCALE: 1/6 FULL SIZE
MATERIAL :- 2"X2"X1/4" ANGLE IRON
1 REQUIRED.

FOR LEFT BANK A-FRAME
COLUMBIA RIVER AT BIRCHBANK

SKETCH #12
18TH JANUARY 1962
WATER RESOURCES BRANCH



BILL OF MATERIALS
FOR ONE MARKER CABLE SUPPORT

DESCRIPTION	QUANTITY
4 1/2" SHEAVE FOR 1/2" WIRE ROPE	1
SHEAVE AXLE, 3/4" X 3 1/2" BLACK MACHINE BOLT WITH NUT & LOCK WASHER	1
SHEAVE ARM, 3" X 4" X 1/4" ANGLE IRON AS DETAILED.	2
SPACERS, 1/2" BLACK IRON PIPE	2
1/2" X 3" SQUARE-HEAD MACHINE BOLTS WITH NUTS & LOCK WASHERS.	2

MARKER CABLE SUPPORT

LEFT BANK – COLUMBIA RIVER AT BIRCHBANK

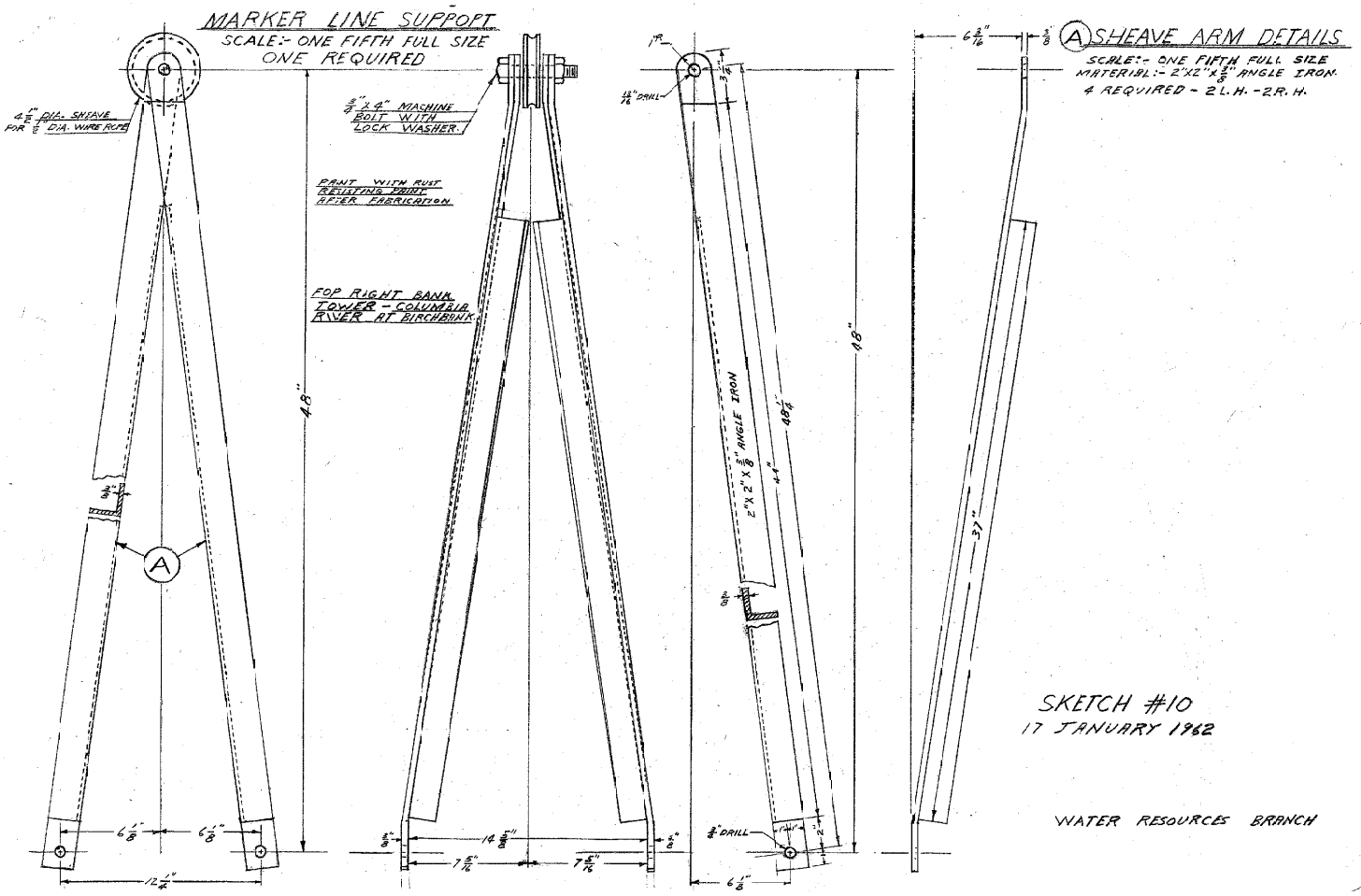
SCALE: 1/2 FULL SIZE

1 REQUIRED

18 JANUARY 1962

SKETCH #11

WATER RESOURCES BRANCH



SKETCH #10
17 JANUARY 1962

WATER RESOURCES BRANCH